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“AVERTIN” IN SURGERY AND OBSTETRICS.

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“I ESTEEM it the office of the physician to mitigate pain and dolours.” Francis Bacon, when he wrote these words, may have added “fear.” Although modern medicine and surgery do much to mitigate “pain and dolours,” how often does one hear from patients that they do not dread the operation, but fear the anæsthetic. In obstetrics what woman does not dread the pain of childbirth?

We have all observed how serious may be the mental distress of the patient on the way to the operating theatre, at the sight of the theatre and during the administration of the anæsthetic. On a sensitive patient this must undoubtedly leave a deep psychic scar. Are our present anæsthetics ideal? To this question any experienced practitioner will certainly answer emphatically “no”!

Chloroform is dangerous to the heart and liver. Ether may be followed by post-operative pneumonia and massive collapse of the lungs. Administration of either is followed by headache, vomiting and frequently coughs, which, following a laparotomy, are torturing to the patient. Gas and oxygen, ethylene and nitrous oxide are safer and almost free from deleterious after-effects, but are debarred from general use on account of expense and cumbersome apparatus.

Many attempts have been made to find substitutes for the inhalation method of producing anaesthesia. Local and spinal anaesthetics have had their champions, but the psychic injury resulting from the patient being conscious during the operation is so great that many surgeons who once were advocates of these methods, have returned to the use of general anaesthetics.

To save the patient from these obvious disadvantages, the rectal route of administering an anaesthetic has long been under trial. Roux first administered an aqueous solution of ether in 1846, but soon discontinued owing to its injurious effects on the bowel mucosa. Pirogoff a year later used ether vapour, but the ether condensed on the rectal wall and caused similar injury. In 1913 Gwathmey introduced a solution of ether in olive oil, but rectal irritation was not completely overcome and the respiratory complications of ether still occurred. The search continued for a non-toxic preparation which did not irritate mucous membrane and which would produce complete narcosis or at least a basal anaesthesia necessitating only small amounts of another anaesthetic to produce a full surgical anaesthesia.

"Avertin," tri-brom-ethyl-alcohol ($\text{CBr}_3\text{CH}_2\text{OH}$), seems to fill all these requirements. It was first used therapeutically by Eichholtz in Germany in 1927. As first introduced it was a crystalline substance soluble in water to make a 3.5% solution at 40°C . "Avertin" is now marketed in a fluid form dissolved in amylene hydrate.

After extensive use in Germany "Avertin" was introduced into England in the early part of 1929, into Australia in August, 1929, into America in 1930. American surgeons were at this time experimenting with "Sodium Amytal" and there "Avertin" had to contend against this local product, but from the latest literature it is fast coming into general use there. Before being generally distributed in England supplies were made available to the Medical Research Council and its Anaesthetics Committee's report summarized is:⁽¹⁾

(a) There is no contraindication to the use of "Avertin" on the score of age.

(b) No state of bodily health, except rectal disease, forbids its use. Cachectic feeble persons suffering from carcinoma of the oesophagus have undergone gastrostomy under "Avertin" anaesthesia with complete success and the same result attended an operation for gall stones in a jaundiced subject.

(c) "Avertin" produces unconsciousness more quickly and quietly than any similar drug with which we have had experience.

(d) After-effects are noticeably absent. The patients sleep three hours after return to bed, the sleep is light, and during this period foreign matter could not enter the larynx without being ejected, and we do not think that "Avertin" need be avoided in operations that involve the air passages, for fear of inhalation of blood afterwards. There is a long period of analgesia and amnesia and this long period of freedom from pain is often an advantage.

(e) "Avertin" is valuable and if used with due care and moderation, it is perfectly safe.

At the discussion on "Avertin" anaesthesia held by the Section of Anaesthetics of the Royal Society

of Medicine in London in 1929,⁽²⁾ Dr. Bloomfield stated that "Avertin" was as pleasant a way of inducing narcosis as could be found, but as a complete anaesthetic *per se* it was not to be relied on. Sir Francis Shipway described his experiences with 106 cases which gave no cause for anxiety, even in full doses. In twenty cases no supplementary anaesthetic was necessary. Dr. James Young reported 154 unselected cases. He considered it superior to ordinary methods in ease and comfort of induction and freedom from post-operative vomiting and respiratory complications. In the series there were two deaths, but neither could be attributed to "Avertin."

In a paper entitled "Experience with Avertin Anaesthesia,"⁽³⁾ Dr. James Young reported 345 unselected cases. In this series there were two deaths, but in neither was "Avertin" the cause. The total mortality rate was 0.6%, as compared with a previous hospital mortality of 1.9% when ether alone or in combination with chloroform had been used. Young stresses the ease, comfort, rapidity and certainty of the anaesthesia. In about 25% of his cases the "Avertin" anaesthesia was sufficient; in the other cases he employed ether as a supplementary anaesthetic. There was almost complete absence of post-operative nausea and sickness. This he considers to be explained by the narcosis lasting some hours after the operation, allowing the elimination of the ether to occur whilst the centres are still dulled. This freedom from sickness he considers one of the most important advantages of "Avertin." He concludes:

I am satisfied that in Avertin we possess a method which is unequalled for safeguarding the patient against the mental distress and physical discomfort commonly associated with anaesthesia and that, at the same time, its administration in combination with a reduced ether inhalation if carried out with care is efficient and safe. Further, the comparative figures . . . suggest that by means of Avertin we are protecting the lives and promoting the recovery of our patients.

Mr. Basil Hughes in another paper wrote⁽⁴⁾ that he had used "Avertin" in every type of surgical case, from operations on the skull and its contents to amputations, and that he would continue to use it owing to properties which are a genuine delight to both patient and surgeon. Its great use is in combination with morphine, infiltration anaesthesia, spinal anaesthesia and inhalation anaesthesia. He concludes:

a. It is non-toxic and absolutely harmless.

b. It is quick in its action; the patients are asleep in from three to five minutes.

c. In the majority of cases it provides refreshing sleep for several hours after operation.

d. It has a beneficial psychological action, for it has banished the dread of the anaesthetic mask and the surroundings of the operating theatre."

He specially stresses its value in children.

Mr. Connell, of Birmingham, wrote an interesting paper on "Avertin in Childbirth."⁽⁵⁾ He describes his technique and stresses the following advantages of "Avertin": (a) safety; (b) ease of administration, (c) effective mitigation of pain for a sufficient period; (d) absence of after results to

mother and child. (The condition of the child generally is better than after an ordinary unassisted labour. He had one still-birth due to intracranial hæmorrhage. The condition of the mother has been excellent; she is never exhausted and there is no delay in the milk flow.) (e) Absence of undue prolongation of labour.

H. W. Featherstone⁽⁶⁾ quotes a report by Dr. Doris Wall:

Avertin is pleasant in its induction and has no action on the fœtus. There are no unpleasant after-effects and there is the advantage of complete amnesia extending some hours after delivery and long after the analgesic effect has passed off.

Adolph Bolliger and Kempson Maddox⁽⁷⁾ published a paper on "Experimental Anæsthesia with Avertin and Sodium Amytal." They tested "Avertin" particularly with regard to its action on the kidneys and its effect on certain metabolic processes. They tested the effect of "Avertin" on the liver following five repeated doses of 0.5 to 1.0 gramme per kilogram within twenty-four hours (dogs tolerate about five times the dose necessary in human beings). The animal appeared no worse for its experience and showed no trace of jaundice and on killing it no trace of damage to the liver or kidneys could be found. In their conclusions they state:

Avertin is a reasonably safe and non-toxic anæsthetic, but with human beings the margin of absolute safety is somewhat less than has been claimed by some of the earlier observers. . . . Renal insufficiency was not found to be a contra-indication to the use of Avertin.

I should like to comment on their conclusion that the margin of absolute safety of "Avertin" in human beings is less than that claimed by earlier observers, for nowhere in their paper are any experiences with the action of the drug on human being mentioned, all the experiments quoted being on animals.

At the annual meeting of the British Medical Association in Manchester in 1929, Dr. George Edwards⁽⁸⁾ read a paper on "Avertin Narcosis." His conclusions are that "Avertin" can be used to provide a deep narcosis which is easily converted into an anæsthesia by giving small quantities of ordinary anæsthetics. It eliminates nearly all mental distress. It has no effect on respiratory tract, and it is well taken by persons with excessive thyroid secretion.

This is the only paper in which I have seen the statement that "Avertin" has no effect on the respiratory tract. Most observers stress the depressant action on respiration and in my own cases the respiration has always been shallower than normal, but the rate usually increased to about twenty-four per minute.

Parsons⁽⁹⁾ wrote a paper on the pharmacological aspects of "Avertin." In his paper he considers the chemistry of the drug and, from personal experiments, its action on the cardio-vascular system and respiration and the rate and mode of its excretion. His conclusions are that it has no appreciable effect on the cardio-vascular system in anæsthetic doses; it is accompanied by slowing of the respira-

tion; toxic doses cause death by respiratory paralysis. It is excreted in the urine over a period of several days, but he could not determine in what form.

At the annual meeting of the British Medical Association, 1930, Dr. Parsons⁽¹⁰⁾ read a paper on "Avertin," in which he covers shortly the pharmacological action and fate of "Avertin" when administered. In discussing the present position of "Avertin" he says that it:

Is preferable to other rectal anæsthetics because it does not irritate the mucosa. . . . Induction is most pleasant for the patient because there is no excitement or struggling and the only sensation appreciated is that of falling asleep. . . . The usual undesirable post-anæsthetic effects seldom occur, but, on the other hand, the patient requires constant attention on account of the prolonged coma. . . . From a study of the literature Lundy (Mayo Clinic) has calculated that the death rate intrinsic to Avertin is about one in 3,333. Hewitt's figures published nearly 40 years ago for chloroform and ether are one in 3,162 and one in 16,302 respectively. It is evident that Avertin is not an anæsthetic for general use when others at our disposal are much safer. Unlike chloroform Avertin has little effect on the heart; its danger depends on its slow destruction and elimination. . . . As Avertin produces marked respiratory depression, its use is inadvisable where there is extensive disease of the lungs. . . . There are certain conditions, however, in which Avertin has a definite advantage over other anæsthetics and the most important of these is exophthalmic goitre. . . . Further, it is useful in certain abdominal conditions because of the absence of post-operative sickness. . . . Avertin is perhaps the best of the solid anæsthetics which have been made available up to the present time.

I have quoted rather fully from this paper, because I was astonished at some of the statements and their contradictory nature and was not surprised to see a letter in a subsequent issue of the journal from Sir Francis Shipway⁽¹¹⁾ which I will also quote fairly fully:

The picture of the present position of Avertin painted by Dr. Parsons is not a true representation of the facts as I see them and gives me almost the impression of having been painted, not from the living model, but from a collection of figures. The statistics of the death rate intrinsic to Avertin quoted from Lundy . . . are derived from a study of the first 30,000 cases. There is little doubt that they had been or would be reduced considerably, for it is known now that the doses originally recommended were excessive and that the substitution of fluid for solid Avertin has introduced into the technique a drug—namely, amylene hydrate—which has a stimulating action on respiration. . . . Further, in any future attempt to estimate the death rate of Avertin, account must be taken of the part played by morphia or other preliminary sedative in increasing the depression of respiration. . . . In two at least of the fatalities, large doses of morphia had been given. . . . It is difficult to agree with the statement that Avertin anæsthesia is followed by prolonged coma or deep sleep from which the patient is aroused with difficulty; this is so contrary to my experience. . . . In conclusion, I hope Dr. Parsons will not hesitate in future to use Avertin where there is serious pulmonary disease; in combination with local anæsthesia or gas and oxygen, it seems to be the ideal anæsthetic.

These extracts from the English literature give some idea as to the present position of "Avertin" in British surgery.

Opinion regarding the risks of "Avertin" narcosis has undergone considerable change since the first

experiments were made, and in examining the earlier accidents investigation has shown them for the most part to have been due to errors in the technique of administration, overdosage and overheating. Those investigators who have published the largest series of cases, have had the smallest number of failures. With increasing familiarity with its employment, the dangers are overcome.

Physical Characters and Chemistry.

"Avertin" is a white crystalline substance, soluble in water at 37° C. (98° F.), making a 3.5% solution. It is now marketed in liquid form, "Avertin Fluid," in which the solid "Avertin" is dissolved in amylene hydrate, one gramme in one cubic centimetre. Fluid "Avertin" is clear and very heavy, mixes readily with water between 37° and 40° C. (98° to 104° F.). If the solution is allowed to cool, the "Avertin" crystallizes out, but the crystals redissolve on heating. If overheated, "Avertin" is decomposed into hydrobromic acid and di-bromacetaldehyde. This latter substance is extremely irritating to the mucous membrane of the rectum and sets up an intense inflammation. Owing to the danger of this decomposition, solutions must be carefully prepared and tested immediately before being administered. The presence of the hydrobromic acid enables this decomposition to be readily detected by adding two drops of a one in 1,000 solution of Congo red to about five cubic centimetres of the prepared solution. If decomposition has occurred, the colour changes to purple or blue and the solution must be discarded. This test is only satisfactory if the solution is mixed with distilled water.

Pharmacology.

"Avertin" has been administered orally, intravenously and by rectum. In human beings the oral method is impracticable on account of the taste. The intravenous method of administration gives a short period of anaesthesia with a rapid recovery. The rectal method of administration is the most practicable and gives the greatest therapeutic margin. It is the only one I will consider in this paper. On administration it is rapidly absorbed from its solution into the blood stream where it circulates at a concentration of about one milligramme *per centum*. It is detoxicated by combination with glycuronic acid derived from glycogen, and is excreted by the kidneys probably in the form of urobromic acid or an organic compound of bromine. The exact form has not yet been determined.

Action on the Heart. There is no appreciable effect (Parsons⁽⁹⁾) on the heart.

Action on the Blood Pressure. Usually the drop in blood pressure is slight, of from 10 to 20 millimetres. Sometimes this may be greater, but is not more than occurs with the usual anaesthetics. I have not recorded a drop of more than 15 millimetres.

Action on the Pulse Rate. Even in operations involving much handling of the peritoneal contents, it is most noticeable that the pulse maintains its quality and its rate hardly varies.

Action on Respiration. "Avertin" itself is a respiratory depressant slowing the respiratory rate and causing shallow respiration, but in the fluid form the presence of amylene hydrate, a respiratory stimulant, counteracts this to a certain extent, and the respirations, although shallow, are increased in rate to 20 to 24 per minute, thus the ventilation is about normal. Not being excreted by the lungs, it has no irritant effect on them and consequently can be used in pulmonary diseases.

Action on Renal Tract. On the renal tract "Avertin" has no action (Bolliger and Maddox⁽⁷⁾).

Action on Liver. Repeated doses administered over a limited period have produced no lesion of the liver,⁽⁷⁾ but for detoxication of the drug the glycogenic function of the liver must be good.

From a consideration of the pharmacology of "Avertin" one may conclude that the only real contraindication to its use is a low glycogenic function of the liver. This occurs in severe liver disease, cachectic states and chronic septic conditions. As contraindications we may add inflammatory disease of the rectum and severe nephritis. It can be used in diseases of the rectum, not of an inflammatory nature, for after induction the remaining fluid can be drawn off.

The solution is highly antiseptic. *Bacillus coli* and *Staphylococcus aureus* are killed *in vitro* within one minute.

Preparation of Solution.

For the preparation of the solution the following apparatus is necessary:

1. A graduated 500 cubic centimetre flask.
2. Ten cubic centimetre pipette.
3. A thermometer.
4. Test tube.
5. Solution one in 1,000 Congo red.
6. A number 18 rubber catheter for surgical cases or number 28 rectal tube for obstetric cases.
7. A funnel.

The amount of "Avertin" necessary for each patient is calculated from the body weight. The normal amount for basal anaesthesia is 0.1 gramme per kilogram of body weight. A ready way to calculate this dose is to multiply the weight in stones by 0.6. This gives slightly less than the actual equivalent and can be corrected by adding:

- 0.1 gramme to the full amount calculated up to five stone.
- 0.2 gramme to the full amount calculated five stone and up to eight stone.
- 0.3 gramme to the full amount calculated eight stone and up to eleven stone.
- 0.4 gramme to the full amount calculated eleven stone and over.

Where fluid "Avertin" is used, one cubic centimetre is equivalent to one gramme.

As one gains experience in the use of "Avertin," one notices that some patients are affected more

than others. This tolerance varies directly with the metabolic rate. Hyperthyroid patients stand large doses well and an exophthalmic goitre patient will readily take 0.2 gramme per kilogram. On the other hand, the hypothyroid type is deeply anaesthetized by the normal dose. The thyroid controls the liberation of glycogen by the liver and thus controls the detoxication of "Avertin." With a normal patient 0.1 gramme per kilogram gives an anaesthesia sufficiently deep for minor operations. This has to be supplemented by local anaesthesia or a general anaesthetic for major work. Full anaesthesia can, in a large number of cases, be obtained from doses of 0.125 gramme per kilogram with a preliminary injection of morphine or, as I have lately been doing, by the addition of 30 cubic centimetres of a 20% magnesium sulphate solution and one cubic centimetre of 3% narcophin to the prepared solution of "Avertin." In obstetric work I use doses of 0.075 to 0.1 gramme per kilogram for the first injection and have repeated the injection up to five times with amounts varying between 0.03 and 0.05 gramme per kilogram, using along with it an intramuscular injection of two cubic centimetres of 50% magnesium sulphate in 2% "Novocain." A dose of 0.1 gramme per kilogram is a perfectly safe dose and until one is well experienced with the "individual" action of "Avertin," larger doses or complete anaesthesia should not be attempted.

Having determined the dose to be used, one puts into the graduated flask sufficient distilled water to make a 2.5% to 3% solution and heats this under the hot water tap or in a vessel of hot water until the water in the flask is at a temperature of 38° C. (100° F.). The required amount of the fluid "Avertin" is then measured out in the graduated pipette and mixed with the heated water in the flask. Before administering the resulting mixture, it must be tested with the Congo red solution. I usually administer the solution in the ward with the patient in bed lying on the side. The catheter is inserted about ten centimetres (four inches) into the rectum and three to five minutes are spent in introducing the solution.

Reaction of the Patient.

Usually within three to five minutes the patient falls asleep naturally and without any excitement; anaesthesia is sufficiently deep for removal to the theatre and for the operation to start in from twenty minutes to half an hour. The pupils are half dilated or less, light reflex is present, but the corneal reflex is not present. If morphine has not been previously administered, the colour is good, but with morphine there is usually a slight cyanosis. At the end of the operation the patient's skin is dry and general condition usually much better than after most other anaesthetics. When the patient becomes deeply anaesthetized, there is a tendency for the tongue to fall back and occlude the fauces. This can be prevented by inserting an airway. This can be left in until after the patient has returned to bed or muscle tone has returned. After about one and

a half hours from the time of administration, tone returns to the muscles and after four or five hours the patient can easily be roused and will answer questions accurately and drop off to sleep again. This drowsy period may last for twelve hours. On recovery there is a further period in which pain perception is lessened. During the recovery period there is complete amnesia. The patient does not remember the questions asked him or if he has been given a drink or a light meal, he will later deny that he has had them. I have had a number of patients even refuse to believe that they have had their operation. The after-effect of "Avertin" is really more a prolonged period of analgesia and amnesia than a true unconsciousness and this long period is often of great benefit in abdominal and pelvic operations, as is likewise the freedom from vomiting and coughing. Most patients are able to do without post-operative administration of morphine. As regards nursing, the patients need no more care than after an ether anaesthesia.

If the depth of anaesthesia with "Avertin" is not sufficient, it can easily be deepened by the administration of a little ether.

As a rule very little is necessary to obtain the right depth of anaesthesia and when this is obtained the administration of the ether may be stopped, a few drops occasionally being all that is necessary to keep the patient at the required depth. On administering the ether, respiratory movements increase, but never to the extent that they do in full ether anaesthesia.

Local infiltration of the operative field combined with "Avertin" narcosis gives an ideal anaesthesia and this method should find great favour in this country where men practising alone, miles from their nearest colleague, have to do urgent operative work with no anaesthetist available.

When a number of cases are being done in succession, the injection is given to the following patient in the ward, so that he is ready immediately the surgeon has finished the preceding operation. The average cost per patient is about five shillings.

Complications.

The complication most to be feared is respiratory failure. This is unlikely to occur if "Avertin" is used as a basal anaesthetic only, that is, when the dose does not exceed 0.1 gramme per kilogram. To counteract this, there should be at hand respiratory stimulants, such as carbon dioxide, lobeline, adrenalin or coramine. As one gets more acquainted with its individual action, larger doses may be used with perfect safety. The safety of inhalation anaesthesia lies in the continuous adaptation of the amount administered to the needs of the patient and in the fact that it can be stopped on the occurrence of any undesirable incident. The safety of "Avertin" anaesthesia is that the margin between the narcotic dose and the lethal dose is great and has been estimated at from 1.7 to 2.0. In ether the margin is 1.33 (Eichholtz). The only other complication reported is prolonged coma ending in death.

Shipway⁽¹⁾ reports one such case after a dose of 0.125 gramme per kilogram. In this case there was probably a deficiency of thyroid secretion diminishing the patient's power of detoxicating the drug. With greater knowledge of the use and action of "Avertin" such cases should be very few. The coma can be counteracted by intravenous glucose injections and thyroxin, two to three cubic centimetres, given intravenously. Quoting from an abstract of an article by Pribram:⁽¹²⁾

In a large number of clinical cases the reviving effect of thyroxin has been surprising. In two cases in which prophylactic doses of thyroxin were given, it was impossible to induce a deep narcosis, even with large doses of "Avertin."

I have used "Avertin" in 175 cases, 140 surgical and 36 obstetrical, with no mortality. At first I used it in selected cases, but now use it in all.

"Avertin" in Surgery.

I have used it with or without premedication and with ether or local anæsthetic to supplement its effect if necessary to produce full surgical anæsthesia. In one case only did respiration stop for a few moments, but this was due to the too rapid and excessive administration of ether. On stopping the ether the patient resumed breathing and her condition at the end of the operation, although it lasted two and three-quarter hours, was all that could be desired.

No special preparation is necessary. Patients have the usual preoperative preparation and are allowed to take food up to one and a half hours before the time set for the operation. I encourage the women to eat sweets and the men marmalade to increase their sugar reserve. Again, I permit the patient, as soon as he is properly awake, to have a light meal if he desires it. Owing to the usual absence of vomiting or cough, the nursing is simplified. I have noticed when morphine and hyoscine have been given as a preliminary to the "Avertin," the patients have remained in a dazed condition for a day or two afterwards. Latterly I have ceased to use hyoscine and if a deep "Avertin" anæsthesia is desired, give only 0.01 gramme (one-sixth of a grain) of morphine and add 30 cubic centimetres of a 20% solution of magnesium sulphate to the enema or else dispense with the morphine and add to the enema instead one cubic centimetre of a 3% solution of "Narcophin." The action of magnesium sulphate is not definitely known. It is what Gwathmey calls a synergistic anæsthetic, in that it

intensifies the action of any anæsthetic with which it is used. The presence of magnesium ions appears to lessen the excitability of the nerve cells. In some cases I have noticed that there appears to be slightly more bleeding than when ether is used. This may be due to the fact that the blood pressure is not much lowered under "Avertin."

Analysis of Surgical Cases.

Types of operation performed were the following: Laparotomy, herniotomy, vaginal and cervical plastic operations, hæmorrhoidectomy, removal of glands from the neck, tonsillectomy, nephrectomy *et cetera*.

Operation time varied from 15 to 170 minutes. In this latter case only 120 cubic centimetres (four ounces) of ether were used.

Abdominal sections numbered 86. In these a supplementary anæsthetic was used in 63. In 53 cases ether in amounts between eight cubic centimetres (two drachms) and 180 cubic centimetres (six ounces) was used, and in ten a local anæsthetic. Vomiting occurred in 26 cases, slightly in 22, and more seriously in four. No post-operative administration of morphine was needed in 36.

Fifty-four operations were performed not involving the opening of the abdominal cavity. A supplementary anæsthetic was necessary in 29 of these. Vomiting occurred in nine cases.

In the accompanying table (Table I) the first hundred cases are analysed.

Severe vomiting means more than once or twice, sufficient to cause the patient some distress.

Complications occurred in one case and were caused by cessation of breathing for a short period on giving ether (case detailed above).

"Avertin" in Obstetrics.

David Masters wrote in his book, "The Conquest of Disease," in 1925:

At present twilight sleep is the monopoly of the well-to-do, but some day it will enter into the homes of the people and motherhood will be robbed of its terrors and pain.

The use of "Avertin" is a big step in this direction, for the technique is easy to acquire and it does not need the constant attention that scopolamine-morphine twilight sleep requires. In a paper read at the annual meeting of the British Medical Association in 1930, entitled "Analgesia and Anæsthesia in Childbirth," Dame Louise McIlroy⁽¹³⁾ made the following statements:

TABLE I.

Dosage of "Avertin."	Number of Cases.	"Avertin" Alone.	Premedication.	Supplementary Anæsthetic.	Vomiting.		Mortality.
					Slight.	Severe.	
Less than 0.1 gramme per kilogram ..	8	None	5	3	0	0	0
0.1 gramme per kilogram ..	34	2	19	26	8	2	0
Over 0.1 up to 0.125 gramme per kilogram	58	6	32	39	14	4	0
TOTAL	100	8	56	68	22	6	0

In obstetrical practice it should be an axiom that pain should be relieved in every case where it does not interfere with the safety of the mother or the child. . . . Although analgesia and anaesthesia may involve risk to the mother and child I am firmly convinced that a considerable amount of our maternal death rate is due to lowered resistance from excessive fatigue, shock and sepsis, the result of withholding relief during labour. . . . Mental suffering, especially fear, has an effect in lowering the resistance to shock and sepsis. I am convinced that better results in the management of labour and in the reduction of maternal mortality will be gained by much greater attention to the relief of suffering in labour. Puerperal insanity can to some extent be prevented by the abolition of anxiety and suffering.

I am entirely in accord with this and for a number of years used scopolamine-morphine narcosis during labour, but when I was able to obtain supplies of "Avertin" I immediately used it with results that are entirely satisfactory. Under its influence labour goes on uninterruptedly and there is little if any delay, not that delay matters in cases when the mother is not suffering; there is very little restlessness and if amnesia is not complete, the patient remembers events, but not the pains.

The condition of the mother and child at the end of labour is good. In administering "Avertin" in child-birth an aperient enema is given as soon after the start of labour as practicable, and at the same time I give an intramuscular injection of two cubic centimetres of 50% magnesium sulphate in 2% "Novocain." When the pains are coming regularly and the patient starts to complain, usually about half way through the first stage, I give the first dose of "Avertin," usually 0.075 gramme per kilogram, following this with another injection of magnesium sulphate. Usually the patient goes to sleep, stirring a little with the pains. After a time, about one and a half hours, the patient gradually comes out, becomes talkative, may even complain that the injection is not acting. It is surprising how far one can let the patient "out" without her having any recollection of events or pain. The judgement of the time to repeat the "Avertin" comes with experience, but is usually from two to two and a half hours. For a second dose I use 0.05 gramme per kilogram. This usually has its effect for three to four hours, when, if necessary, another dose of 0.05 or less may be given. I give a third injection of magnesium sulphate, but no more.

The doses and times I have quoted are average, but will certainly give great relief in any case. As experience is gained, one can better judge the case and personal idiosyncrasies. In no cases have I given any morphine.

After the birth the mother sleeps for several hours and wakes up in a very fresh condition, in contrast

to where "Avertin" has not been used, when for twenty-four hours or more the mother is "played out."

Obstetric cases numbered 38. The length of labour varied between two and a half and thirty hours (excluding a case of primary inertia which lasted 105 hours). Table II sets out the particulars.

The condition of the children generally was good, but three were slightly blue, four were sleepy for a day or two. There were two deaths, neither due to "Avertin" (one premature baby, 30 weeks, lived for two days, the other, born after a face presentation, died on the nineteenth day from cerebral compression due to intracranial hæmorrhage).

The ready way in which the child commences breathing after birth and the absence of signs of narcotization are striking. An explanation of this may be afforded by the recent experiments of Boucek and Renton⁽¹⁴⁾ at the University of Pittsburgh. They show that another crystalline substance, "Sodium Amytal," passes with difficulty and perhaps not at all from the mother to fœtus, but readily from fœtus to mother. They write:

These experiments add further evidence in favour of the conclusion drawn by Boucek that the placenta behaves as an organ or organ system which selects or rejects certain materials. . . . It is our opinion that the cells of the placenta are selective in character and that there is a mechanism, as yet unknown, which not only prevents harmful products from entering the fetus, but reacts quickly to transfer harmful products from fetus to mother.

The mother's condition in every case was excellent. There was no morbidity and no delay in the milk flow, which, if anything, was quicker and freer than otherwise.

I used "Avertin" in one case of *interpartum* eclampsia with the urine solid with albumin. The patient had two injections. The first of 0.1 gramme per kilogram was not fully retained. The second of 0.075 gramme per kilogram was given two hours after the first. The mother was restless during labour and the child was born sleepy. The next day the condition of both mother and child was all that could be desired.

Discussion.

"Avertin" has now been on its trial in Sydney for eighteen months and is fast gaining favour.

The main adverse criticisms of "Avertin" are that: (i) It is dangerous and (ii) it cannot be controlled.

In answer to the first I think that I have produced sufficient evidence from British sources and personal experience to show that, properly used and understood, it is not dangerous and is really safer than older methods of anaesthesia. If used

TABLE II.

Observation.	Primiparae.	Multiparae.
Average length of labour	15½ hours	8 hours
Average time from commencement of labour to first dose of "Avertin" ..	6 hours	3 hours
Average total dose	0.155 gramme per kilogram	0.136 gramme per kilogram
Average number of doses	3	2

only as a basal anæsthetic, which is all that is claimed for it, with ether or infiltration anæsthesia to obtain full surgical depth, it is safer than ether, hitherto the safest anæsthetic generally used (Karber).

The second criticism could be given only by men who do not at all understand what "Avertin" is. There is no need for control provided there has not been overdosage, and when it is used in 0.1 gramme per kilogram doses there is such a large margin of safety that overdosage is highly improbable. Anæsthesia can be deepened by small doses of ether *et cetera*. The period of sleep and amnesia following "Avertin" is a great advantage in surgery and if need arise, this period can be shortened by thyroxin and glucose injections.

Summary.

1. A résumé of the British literature on "Avertin" is given. This indicates that most of the authors consider "Avertin" to be a safe and useful addition to the anæsthetics at our disposal.

2. The chemistry and pharmacology are considered. "Avertin" is shown to have no deleterious action on the heart, kidneys or the liver, and produces only a slight to moderate fall in the blood pressure.

3. Personal experiences of its use in surgery and obstetrics are given. These show that it is a very pleasant, easy and safe way of producing anæsthesia in surgery and analgesia in child-birth.

4. Certain adverse criticisms have been answered.

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"SODIUM AMYTAL" IN ANÆSTHESIA.

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IN view of the obvious improvements that have been made in anæsthesia due to "Sodium Amytal," "Avertin" and "Luminal," I have thought some effort should be made to find out the defects first and the virtues second of one and all.

Dr. Hardwicke undertook to observe and control a series of cases for me and he has described his results.

"Sodium Amytal" was chosen to begin with on account of its extraordinary safety, flexibility of administration, and successful results, as shown in the enormous flood of literature on the subject. Although the trial has impressed on us the fact that we have entered on a new era of anæsthesia, I thought it best shortly to emphasize the traps and pitfalls one may encounter, rather than cloud them with unstinted praise.

We commenced by using the intravenous method, as it seemed safer in that the administration could be stopped when the patient's condition warranted it.

All went very well until a case was being demonstrated before the Fellows of the College of Surgeons of Australasia. This is the one that would go wrong, of course, and the resident medical officer had great difficulty in getting the needle into a vein, as the patient was very fat and the veins very small. However, he ultimately succeeded and the result was perfect.

Gaining confidence in our dosage, we thought it safe to give similar amounts orally and the more dramatic intravenous has been given up for the equally efficient oral method.

As some individuals have an idiosyncrasy against the barbiturates, it was decided to give a dose of 0.18 to 0.3 gramme (three to five grains) the night before the operation, when possible, to ascertain any idiosyncrasy and to insure the patient a perfect sleep.

It must be clearly understood that "Sodium Amytal" should not yet be considered as the main part of the anæsthetic and clearly realized that some form of inhalation or local anæsthetic will be needed. Although we have performed quite successfully large plastic operations and curettage of the uterus without anything further than "Sodium Amytal," still our tendency has been to reduce the dose and place more reliance on ether.

The post-operative stupor constitutes one of the most outstanding virtues of the drug, for patients miss altogether the pains of the first thirty-six to seventy-two hours. This very virtue, though, becomes one of the main contraindications of its use in quite a number of ways.

In such chest, mouth, throat and nose operations when an active coughing reflex may be necessary,

its use would seem wrong. Similarly, too, when the active cooperation of body and mind seemed desirable, it would be contraindicated, except in small doses. It has been suggested that pulmonary complications are more likely to occur on this account. This may be so, but the risk is more than counterbalanced by the absence of struggling, salivation and vomiting during induction and recovery. We have had no such complication.

The drowsiness is a matter of concern to the nursing staff, as the patient lies inert and gives no help. This is a matter for serious consideration in the absence of an efficient nursing staff. Even when there are plenty of nurses, very heavy, fat women should have a moderate dosage. In addition, much longer and closer observation is necessary, as the jaw seems to drop back readily and the colour to become unsatisfactory when this occurs. Patients who have to go to their homes soon after minor operations, would not be suitable, and when minor operations are performed only a small dose should be used.

One patient, the subject of a diagnostic uterine curettage, was given 1.6 grammes (twenty-seven grains). She weighed 69.3 kilograms (eleven stone). The dose was too much altogether, for she drowsed on for over forty-eight hours and was quite annoyed about it. This, of course, was one of our errors and I want to mark them plainly.

It takes an anaesthetist some time to realize the small amount of ether that is required. For example, after half an hour's plastic work I inquired how much ether had been used, and was told seven ounces. This was too much and after the abdominal incision had been made the mask was taken off and no further ether given. This in a 63 kilogram (ten stone) woman with a dose of 1.02 grammes (seventeen grains) one and a half hours before operation.

Contraindications from the point of view of the patient's condition form another large group. Such conditions are largely those of metabolism and elimination due to hepatic, pancreatic or renal insufficiency. The latter should be particularly noted and such subjects as elderly prostates with dubious renal efficiency would seem unsuitable. Diabetics are considered very bad subjects.

In view of these contraindications and the understanding that "Sodium Amytal" is not yet to be considered the primary anaesthetic, it is clear that ether must still remain our sheet anchor and it must remain the commonest anaesthetic in use, particularly in the teaching hospitals.

Dr. Hardwicke will elaborate the virtues and defects of "Sodium Amytal," its safe and easy administration, the removal of preoperative fears and post-operative pains, with the consequent advantages of reduction of psychological and physiological shock. We propose to try "Avertin" next and then "Luminal," but I know enough now to allow me to express the opinion that the use of "Sodium Amytal" or one of the allied group forms the greatest advance in anaesthesia since the very discovery of ether and chloroform.

"AVERTIN" RECTAL ANÆSTHESIA: A FURTHER REPORT.

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FURTHER to my address on "Avertin" Rectal Anæsthesia," published in THE MEDICAL JOURNAL OF AUSTRALIA on April 19, 1930, the following list of operations performed by myself or my husband, Dr. T. A. Wright, under "Avertin" narcosis, together with essential practical clinical notes, demonstrates a wider range of surgical cases in which use can be made of its preoperative and postoperative benefits, both to surgeon and patient.

In no case did the "Avertin" anaesthesia give rise to any untoward incident or anxiety, rather, indeed, the more it is used, the more the ease of induction, the absence of shock and the operative and postoperative comfort are appreciated. Some of the operations here reported, namely, cases numbers 28 to 34 inclusive, were performed by me at the Queen Victoria Hospital, Melbourne, as demonstration cases in the use of "Avertin" in anaesthesia.

In each instance the "Avertin" was personally administered by one of us and an anaesthetist was also in attendance to superintend the anaesthetized patient and to administer any necessary supplementary anaesthetic. The chloroform-ether mixture that I use as a supplement is composed of one part (by fluid measure) of chloroform with five parts of ether.

At the awakening stage some patients have needed a sedative, morphine 0.01 gramme (one-sixth of a grain); others have needed no sedative.

The benefit of this anaesthetic to the surgeon was particularly noticed in the transperitoneal removal of the kidney (case number 28). The incision was both vertical and transverse, and the quietness of the breathing and perfect relaxation allowed the abdominal viscera to be packed off comfortably without any heaving or bulging, thus providing easy complete exposure of the carcinomatous kidney and the renal vessels which were able to be ligated separately well away from the kidney. The absence of shock was very much appreciated.

The "Avertin" anaesthesia was most satisfactory in the pulmonary hydatid operation (case number 29). The patient was just breathing quietly and regularly all the time, as if asleep, and the placidity of the body made the operative procedure quite easy and free from any reflex, even while my finger was exploring deep round the left auricular region. On the previous occasions when I have operated for pulmonary hydatid, inhalation anaesthetics were used and in comparison the "Avertin" anaesthesia is easily preferable, in my opinion.

Similarly, I have in the past used ether, gas and oxygen or ethylene anaesthesia for the operation of

TABLE SHOWING RESULTS OF

Serial Number, Sex, Age (Years).	Pre-Operative General Condition.	Surgical Condition.	Operation Performed.	Pre-Narcosis, with Morphine One Hour Before.	"Avertin" Dosage.	Administered.	Narcosis Established.	Operation Commenced.
17 M. 64	Weight, 93.6 kilograms (14 stone 12 pounds). Stout and plethoric.	Hæmorrhoids.	Excision and suture.	0.01 gramme ($\frac{1}{4}$ grain).	0.10 gramme per kilogram body weight.	On table.	In six minutes.	Thirty minutes after administration.
18 F. 48	Weight, 44.1 kilograms (7 stone). Frail body.	Two calculi in left renal pelvis.	Pyelolithotomy.	0.01 gramme ($\frac{1}{4}$ grain).	0.11 gramme per kilogram body weight.	On table.	In eight minutes.	Twenty-five minutes after administration.
19 F. 41	Weight, 55.8 kilograms (8 stone 12 pounds). Good condition.	Myomata uteri, plastic pelvic peritonitis; chronic appendicitis with adhesions.	Subtotal hysterectomy, appendectomy.	0.01 gramme ($\frac{1}{4}$ grain).	0.125 gramme per kilogram body weight.	In bed.	Somnolent in six minutes, narcosis in nine minutes.	Forty-five minutes after administration.
20 F. 31	Weight, 59 kilograms (9 stone 5 pounds). Well-nourished body; pallid appearance.	Large myomata uteri; adhesions of omentum to the rectum.	Subtotal hysterectomy, appendectomy, removal of adhesions.	0.01 gramme ($\frac{1}{4}$ grain).	0.125 gramme per kilogram body weight.	In bed.	In five minutes.	Thirty-five minutes after administration.
21 F. 24	Weight, 54.9 kilograms (8 stone 10 pounds). Good condition.	Large left parovarian cyst.	Removal of cyst, Gilliam's operation, appendectomy.	0.01 gramme ($\frac{1}{4}$ grain).	0.125 gramme per kilogram body weight.	On table.	Narcosis in six minutes.	Twenty minutes after administration.
22 F. 41	Weight, 56.7 kilograms (9 stone). General condition good.	Myomata uteri.	Subtotal hysterectomy.	0.01 gramme ($\frac{1}{4}$ grain).	0.125 gramme per kilogram body weight.	In bed.	Somnolent in five minutes, narcosis in nine minutes.	Twenty-five minutes after administration.
23 F. 70	Weight, 49.5 kilograms (7 stone 12 pounds). Very fair general condition.	Carcinoma of breast.	Radical operation with removal of <i>musculi pectorales, major et minor</i> .	0.01 gramme ($\frac{1}{4}$ grain).	0.12 gramme per kilogram body weight.	In bed.	Narcosis in eight minutes.	Twenty-eight minutes after administration.
24 F. 48	Weight, 52.2 kilograms (8 stone 4 pounds). Condition good; has chronic rheumatic valvulitis.	Myomata of retroverted uterus, chronic appendicitis, two external hæmorrhoids.	Subtotal hysterectomy, appendectomy, excision and suture of hæmorrhoids.	0.01 gramme ($\frac{1}{4}$ grain).	0.125 gramme per kilogram body weight.	In bed.	In six minutes.	Thirty-five minutes after administration.
25 F. 39	Weight, 56.7 kilograms (9 stone). Well-nourished body, pallid appearance; very neurotic temperament.	Fibrotic retroverted uterus, chronic appendicitis.	Subtotal hysterectomy, appendectomy.	0.01 gramme ($\frac{1}{4}$ grain).	0.125 gramme per kilogram body weight.	In bed.	In five minutes.	Thirty minutes after administration.
26 F. 64	Weight, 49.9 kilograms (7 stone 13 pounds). Fair condition.	Acute cholecystitis, subacute appendicitis.	Cholecystectomy, appendectomy.	0.01 gramme ($\frac{1}{4}$ grain).	0.11 gramme per kilogram body weight.	On table.	Somnolent in four minutes, narcosis in five and a half minutes.	Forty-five minutes after administration.
27 F. 16	Weight, 50.4 kilograms (8 stone). Good condition.	Retroposed uterus, chronic appendicitis (appendix long coiled adherent and retrocaecal).	Dilatation and curettage, Gilliam's operation, appendectomy.	0.008 gramme ($\frac{1}{4}$ grain).	0.12 gramme per kilogram body weight.	On table.	In five minutes.	Thirty minutes after administration.

"AVERTIN" NARCOSIS.

Supplementary Anæsthetic.	Pulse.	Respiratory.	Vomiting.	Post-Operative Pain.	Discomfort.	Remarks.
32 cubic centimetres (8 fluid drachms) chloroform-ether mixture.	Practically no variation.	Respirations easy and free, 18 to 20 per minute.	None.	None.	None.	Some of the anæsthetic fluid was expelled on gripping the first hemorrhoid. No further reflex manifestation.
Nil.	Rate per minute: 74 before "Avertin," 70 operation begun, 90 delivering the kidney, 60 at finish.	No colour change; respirations easy and free, 22 to 26 per minute.	Effortless vomiting of two small lots of clear fluid.	Occasional slight pain deep in the left loin.	Very slight.	Anæsthesia was perfect for operative comfort. Very good convalescence.
28 cubic centimetres (7 fluid drachms) chloroform-ether mixture.	Very little change in volume and force. Rate slowed from 80 to 68.	No colour change; easy and free, shallow excursions.	One mouthful of clear fluid, effortless; no retching.	Very slight in the wound on the second day only.	None.	Has no remembrance of the first twenty-four hours, though quite awake in the afternoon of the day of operation.
18 cubic centimetres (4½ fluid drachms) chloroform-ether mixture.	Slight lessening in volume and force. Pulse rate slowed by 8 to 10 beats per minute.	Faint cyanotic colour change; free and regular respirations.	None.	None.	None.	Has no appreciation of having had an operation. Convalescence excellent.
24 cubic centimetres (6 fluid drachms) chloroform-ether mixture.	Practically no variation.	No colour change; quiet and free diaphragmatic respiration.	None.	None.	None.	The supplementary anæsthetic was required to quieten slight reflex leg movement while suturing the round ligaments and also the skin.
36 cubic centimetres (9 fluid drachms) chloroform-ether mixture.	Volume and force satisfactory. Rate: 84 per minute at start, 60 during operation, 92 at finish.	No colour change; respiration slowed a little, easy and regular.	None.	None.	None.	Practically no remembrance of the first twenty-four hours. Quite a different experience from a previous operation.
Nil.	Pulse regular, good. Rate: 52 at commencement, 46 } during operation, 46 at termination.	Respirations easy, regular and free, 24 per minute.	None.	None.	None.	Slept all the afternoon and night of operation day. Next day had no appreciation of having had the operation. Moving the arm freely without pain in two days.
Nil.	Volume and force decreased considerably. Rate: 102 before "Avertin." At 8.41 a.m., pulse 96, narcosis; 9.5 a.m., pulse 90; 9.30 a.m., pulse 72; 9.40 a.m., pulse 60, with sinus arrhythmia; 11.5 a.m., pulse 72, operation completed.	Respirations regular, slow and shallow; colour pale considerably; normal colour returned later during the operation.	None.	None.	None.	Very delighted at the absence of any appreciation of an operation. Has practically no remembrance of the first twenty-four hours after operation, although awake off and on.
40 cubic centimetres (10 fluid drachms) chloroform-ether mixture.	Pulse rate during the operation: 96, 106, 86, 82, 80, 86 per minute; with good force and volume.	Cyanotic tint at first; colour pale considerably later on. Respiratory rate always very rapid, regular and easy: 48, 40, 44, 70, 44, 40.	Vomited bile twice.	Moderate amount of pain on second day.	Comfortable on the operation day; hysterical discomfort on second day only.	Some of the "Avertin" fluid was lost during administration due to imperfect funnel. Her pupils remained much more dilated than usual.
20 cubic centimetres (5 fluid drachms) chloroform-ether mixture.	Volume and force good. Rate: 76 in ward, 66 at start of operation, 76 at ligation of duct, 68 at suture of peritoneum.	Easy and free. Rate increased to 44 on exploring and removing gall bladder, 36 while sewing up the peritoneum.	None.	None.	None.	No remembrance of the first twenty-four hours after operation. Slept peacefully all the afternoon and evening, awakening occasionally. Excellent convalescence.
20 cubic centimetres (5 fluid drachms) chloroform-ether mixture.	Good volume and force. Rate: 96 on narcosis, 114 to 120 on suturing the skin, 96 at termination.	No colour change; easy regular respiration. Rate: 18 at commencement; 30 during dilatation; then 20 } mesentery, 34 } 22 at termination.	None.	None.	None.	No remembrance of the first twenty-four hours after operation.

TABLE SHOWING RESULTS OF

Serial Number, Sex, Age (Years).	Pre-Operative General Condition.	Surgical Condition	Operation Performed.	Pre-Narcosis, with Morphine One Hour Before.	"Avertin" Dosage.	Administered.	Narcosis Established.	Operation Commenced.
28 F. 53	Weight, 59 kilograms (9 stone 5 pounds). Condition only fair.	Tumour of right kidney, hæmaturia for one and a half years (adenocarcinoma).	Transperitoneal radical extirpation of right kidney.	0.01 gramme ($\frac{1}{4}$ grain).	0.125 gramme per kilogram body weight.	On table.	In eight minutes.	Twenty-two minutes after administration.
29 F. 18	Weight, 40 kilograms (6 stone 5 pounds). Very sick girl.	Hydatid of left lung, hydropneumothorax.	Thoracotomy, drainage of cyst.	Nil.	0.11 gramme per kilogram body weight.	On table.	In six minutes.	Twenty-two minutes after administration.
30 F. 28	Weight, 61.6 kilograms (9 stone 11 pounds). Good condition; hysterical temperament.	Cholelithiasis, cholecystitis.	Cholecystectomy, appendicectomy.	0.01 gramme ($\frac{1}{4}$ grain).	0.125 gramme per kilogram body weight.	On table.	In eleven minutes.	Twenty-four minutes after administration.
31 F. 57	Weight, 58 kilograms (9 stone 3 pounds). Good condition.	Left inguinal hernia of very large size.	Radical cure.	0.01 gramme ($\frac{1}{4}$ grain).	0.125 gramme per kilogram body weight.	On table.	In seven minutes.	Twenty-three minutes after administration.
32 F. 56	Weight, 60.7 kilograms (9 stone 9 pounds). Condition only fair.	Cholelithiasis, cholecystitis.	Cholecystectomy, appendicectomy.	0.01 gramme ($\frac{1}{4}$ grain).	0.125 gramme per kilogram body weight.	On table.	In six minutes.	Twenty-six minutes after administration.
33 F. 33	Weight, 45.2 kilograms (6 stone 12 pounds). Not good.	Exophthalmic goitre.	Removal of right lobe, isthmus and part of the left lobe of thyroid.	0.01 gramme ($\frac{1}{4}$ grain).	0.125 gramme per kilogram body weight.	On table.	In ten minutes.	Twenty-eight minutes after administration.
34 F. 62	Weight, 63.4 kilograms (10 stone 1 pound).	Carcinoma of right breast.	Radical removal of right breast and <i>pectorales major and minor</i> .	0.01 gramme ($\frac{1}{4}$ grain).	0.125 gramme per kilogram body weight.	On table.	In nine minutes.	Thirty-four minutes after administration.
35 M. 8	Weight, 26.1 kilograms (4 stone 2 pounds). Good condition.	Subacute appendicitis, long adherent prepuce.	Appendicectomy, circumcision.	None.	0.1 gramme per kilogram body weight.	In bed.	In four minutes.	Twenty minutes after administration.
36 F. 46	Blanched white; condition very bad; cachectic; gross secondary anemia.	Vaginal hemorrhage; recurrent carcinoma <i>uteri</i> in the vaginal vault.	Insertion of radium needles.	0.01 gramme ($\frac{1}{4}$ grain).	0.1 gramme per kilogram body weight.	In bed.	In a few minutes.	Sixty minutes after administration.
37 M. 4½	Weight, 16.2 kilograms (2 stone 8 pounds). Sick child.	Subacute appendicitis with mesenteric adenitis.	Appendicectomy.	None.	0.1 gramme per kilogram body weight.	In bed.	In seven minutes.	Twenty-five minutes after administration.

thyroidectomy and, compared with these inhalation anæsthetics, I found that "Avertin" gave much more relaxation of the tissues and muscles of the neck and hence more comfort and ease for the operative procedure. In case number 33 the thyroid

gland was wrapped round and adherent to the trachea which was considerably thinned out, and during the dissection of the gland from the trachea there was a total absence of any spasmodic breathing or interference with respiration, as is so often

"AVERTIN" NARCOSIS (Continued).

Supplementary Anæsthetic.	Pulse.	Respiratory.	Vomiting.	Post-Operative Pain.	Discomfort.	Remarks.
10 cubic centimetres (24 fluid drachms) chloroform-ether mixture.	Good volume and force. Rate: 88 injection begun, 70 at commencement, 90 on opening peritoneum, 66 on manipulating kidney, 64 at termination.	Colour good; occasional grunt; soft shallow respiration.	None.	None; no sedative required.	None.	Anæsthesia was perfect for this extensive procedure. Remarkable absence of movement of abdominal viscera. Excellent convalescence.
Nil.	Pulse steady, good. Rate: 128 at start, 118 at rib cutting, 125 at opening of cyst, 128 at termination.	Easy and free; some grunting on exploring cyst cavity; colour went bluish as cyst was opened.	None.	Practically none.	None.	The ectocyst was adherent to pericardium. Convalescence excellent.
24 cubic centimetres (6 fluid drachms) chloroform-ether mixture.	Good force and volume. Rate: 80 on administration, 100 on cutting the skin, 130 removing gall bladder, 82 at termination.	Colour good; quiet breathing.	Vomited once only.	Slight pain.	Very little.	Uneventful comfortable convalescence.
Nil.	Pulse good. Rate: 68 at start, 78 opening the sac, 68 at termination.	Easy and free; some snoring; faint bluish tint, colour good at finish.	None.	Practically none.	None.	Uneventful comfortable convalescence.
Nil.	Good volume. Rate: 100 at administration, 118 at commencement, 115 removal of gall bladder, 88 near termination.	Slightly bluish tint at first, good colour at the end; quiet and easy respirations.	None.	Practically none.	None.	Comfortable convalescence.
Nil.	Pulse rate: 100 at "Avertin" enema, 128 at narcosis, 122 during operation, 130 on skin traction, 120 at termination.	Colour good; slow regular respirations.	None.	None.	A little discomfort for the second twenty-four hours.	The discomfort was that of thyrotoxicism, which soon responded to treatment.
Nil.	Good volume and force. Rate: 100 before enema, 96 on narcosis, 100 on baring chest wall, 92 at termination.	Bluish tint, which disappeared later; regular easy respiration.	None.	Slight pain at the site of the drain tube.	Practically none.	Uneventful convalescence. Moving the arm comfortably in two days.
8 cubic centimetres (24 fluid drachms) chloroform-ether mixture during the circumcision.	Pulse remained regular and good.	Colour paled a little; respirations normal and easy.	Vomited once a small amount clear fluid just after drinking a full glass of water.	None.	None.	Except for seeing the skin sutures, he has no appreciation of having had an operation.
Nil.	Pulse very poor; practically no change.	Quiet and easy respiration.	None.	Slight pain from irradiation cystitis and proctitis.		Slept off and on during the first twenty-four hours. Then proctitis discomfort for three or four days. Excellent rapid general improvement.
10 cubic centimetres (24 fluid drachms) chloroform-ether mixture.	Pulse good, regular. Rate: 96 before "Avertin" enema, 88 when narcosed, 116 all during the operation, 130 at termination.	Shallow regular diaphragmatic breathing. Rate varied from 40 to 48 per minute.	One effortless vomit of about 16 cubic centimetres (4 fluid drachms) of thick bile.	None.	None.	Slept off and on during the afternoon and night of the operation day. No sedative given.

experienced with ordinary inhalation anæsthesia during that stage of the dissection.

In conclusion I can only state that "Avertin" for anæsthesia has been so satisfying that I prefer it to other anæsthetics and in my experience of its

use in the thirty-seven cases reported and in a subsequent series of over one hundred cases I have found that "Avertin" anæsthesia has been most satisfactory and free from any untoward incident or anxiety, and that it gave distinct advantages to surgeon, anæsthetist and patient, especially the aged.

EXPERIENCES WITH "SODIUM AMYTAL" AS A BASAL ANÆSTHETIC.

By G. A. HARDWICKE, M.B., Ch.M. (Sydney),
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THE first reports of the use of iso-amyl-ethyl-barbituric acid in anæsthesia were published by Ravdin and his coworkers in *The American Journal of the Medical Sciences* in 1929. Most of the early experiments had been done by American workers before these authors employed it on the human subject. It is a white crystalline powder readily soluble in water, slightly bitter to the taste. As some persons are known to exhibit an idiosyncrasy to veronal and other barbituric acid derivatives, the possibility of this emergency must be borne in mind when using "Sodium Amytal." When oral administration is planned, it is my routine to give a small dose as a sedative the night preceding operation. When the drug is used intravenously, the injection may be stopped immediately any distress is manifested. I have not encountered any idiosyncrasy in over two hundred cases.

I first used the drug in January, 1930, in conjunction with Dr. Leslie Abramovich. A subtemporal decompression for pituitary tumour was performed, and only 90 cubic centimetres (three ounces) of ether were required for one hour of anæsthesia. Although headache and vomiting had been frequent before operation, neither had returned for the following ten months, at which time the patient was seen last. Since then I have used "Amytal" in two hundred and seven surgical and obstetrical procedures. In forty of these the oral route of administration has been employed. The drug as supplied (for intravenous use) is packed in ampoules containing 0.5, 1.0 or 1.5 grammes and sufficient triple distilled water to make a 10% solution is contained in an accompanying ampoule. Gelatin capsules for oral use, each containing 0.18 gramme (three grains), are obtainable in bottles of forty.

Dosage.

The manufacturers supplied in the first instance ampoules containing 1.5 grammes, with the recommendation that the maximum dose should not exceed 1.6 grammes. My first patient weighed 66 kilograms (ten stone seven pounds) and was given the maximum dose recommended. The following twenty patients were given approximately 25 milligrammes per kilogram of body weight. It would seem that such large intravenous doses are undesirable, as the subsequent period of unconsciousness may be so prolonged as to render repeated catheterization necessary. Smaller doses of "Sodium Amytal," for example, 15 to 20 milligrammes per kilogram of body weight, given intravenously, were equally satisfactory when morphine and atropine were administered hypodermically as an adjuvant. Recently 0.43 milligramme (one one-hundred-and-

fiftieth of a grain) of hyoscine and 0.01 gramme (one-sixth of a grain) of morphine have been found still more satisfactory in this connexion; in fact, if the drug is to be taken by mouth, the result is rendered the more certain by this procedure. Relatively larger doses are required by mouth to obtain unconsciousness, and the results are less uniform. I have given 2.0 grammes (thirty grains) to a patient weighing 58.5 kilograms (nine stone four pounds) in divided doses: five capsules of 0.18 gramme (three grains) one and a half hours prior to operation and the dose repeated half an hour later. This patient was sufficiently unconscious to have uterine curettage and perineal repair performed without any other anæsthetic. Sufficient muscle relaxation for upper abdominal work cannot be obtained excepting with massive doses. Lundy⁽¹⁾ has employed doses of 2.7 grammes (forty-five grains) and the patient awakened on the third day. He gave fifty milligrammes per kilogram of body weight in some instances, but thinks that pulmonary oedema and bronchopneumonia may follow such large doses. Smaller hypnotic doses are very satisfactory given orally, but dosage is much more readily calculated by using the intravenous route. From one patient who vomited next day, the remains of capsules were recovered. This fact emphasizes the unreliability of absorption from the alimentary canal. Aged and debilitated patients require relatively smaller doses than healthy, vigorous adults. An excited person is apparently more tolerant than following a sedative; attempts to engage the patient in conversation prolong the period of induction.

Recently I have been administering a maximum dose of 1.0 gramme intravenously or 1.5 grammes by mouth, combined with the hypodermic injection of morphine and hyoscine in each instance. With this dosage very little ether is required for the performance of major surgical procedures. The skin reflexes are late to disappear and frequently 60 to 90 cubic centimetres (two to three ounces) of ether on an open mask will be required to produce sufficient analgesia at the commencement of the operation to prevent movement when the incision is made. For subsequent maintenance approximately 120 to 180 cubic centimetres (four to six ounces) of ether per hour are usually sufficient. However, there is considerable variation in individual susceptibility. A "Record" syringe, with eccentric aperture, of ten cubic centimetres capacity, is the most satisfactory. One large needle and a small hypodermic needle complete the outfit. If doses are to exceed one gramme, then a syringe of twenty cubic centimetres capacity is employed. The eccentric aperture facilitates the injection. The large needle is used for dissolving the drug, the smaller needle is less likely to cause extravasation from traumatized tissues. The rate of injection should not exceed one cubic centimetre of a 10% solution per minute. The presence of muscular tremors may increase the difficulty of entering a vein. On one occasion resort was made to the saphenous vein at the ankle for this reason.

The Induction.

The patient is prepared as for any other general anæsthetic. As there is little tendency to nausea and vomiting after the operation, the period of starvation prior to the anæsthetic should be just long enough for the stomach to empty. In some persons there is unwillingness to eat for thirty-six to forty-eight hours, so that a shortened period of preliminary starvation is very desirable.

Two patients in whom the hypodermic use of morphine had been omitted, had a tendency to laryngospasm followed by a convulsive cough which persisted for several minutes. Both patients were old men addicted to tobacco. In no case has there been any stage of excitement necessitating restraint. Loss of consciousness is always associated with a fall in blood pressure. This has been estimated each minute during the injection of thirty consecutive doses. The fall is most rapid up to the point at which unconsciousness supervenes, and is greatest in persons with hypertension. The fall is greater proportionately in the systolic than in the diastolic readings. The rate of injection influences the depression of both blood pressure and respiration. Recently we have found that the depression of respiration is roughly proportional to the fall of blood pressure. When the drug is given by mouth, the fall of blood pressure is relatively less than when it is given intravenously. The drug may also be given intramuscularly or *per rectum*, but I have had no experience with these methods. The average fall in systolic blood pressure in the thirty cases above mentioned was 42 millimetres of mercury.

The maximum fall in pressure in this series was in a patient of eighty-one years, when the readings fell from 158 millimetres of mercury systolic and 86 millimetres diastolic to 62 millimetres systolic and 48 millimetres diastolic, when 0.9 gramme had been injected during a period of eleven minutes. At this point one cubic centimetre of "Vasopressin" and 0.03 gramme (half a grain) of ephedrine were injected hypodermically, and at the end of six minutes the readings were 82 millimetres systolic and 56 diastolic. No supplementary anæsthetic was required for the removal of cataract from the eye. The patient returned to the ward in good condition after forty-five minutes in the amphitheatre, her readings then being 70 millimetres systolic and 54 diastolic.

Another patient who underwent prostatectomy (not included in this series) had a blood pressure of 225 millimetres of mercury systolic and 130 diastolic prior to injection. His readings fell to 120 and 76 millimetres during the operation and remained below 150 millimetres systolic and 100 diastolic for the three succeeding days, when he succumbed to apoplexy.

After the disappearance of any preliminary apprehension the pulse rate is scarcely influenced during induction; even when the blood pressure has fallen to 70 millimetres of mercury systolic, the pulse rate may remain at 70 to 75 per minute. The stage of unconsciousness is associated with relaxation of the pharynx and the tongue and the mandible must be held forwards to maintain a free airway.

Maintenance of Anæsthesia.

The profuse sweating sometimes seen when ether alone is used, is absent with "Sodium Amytal." The

colour remains good and the patient appears to be in physiological sleep. Only once has cyanosis been observed and this was attributed to elevation into the Trendelenburg position too soon following induction.

Any inhalation or local anæsthetic may be employed concomitantly. For thyroidectomy its use with infiltration of the skin along the line of incision appears to be very satisfactory. Only a very small amount of chloroform is required to give rapid and complete muscular relaxation for upper abdominal manipulations. Ether given on an open mask is the most satisfactory in my experience, as it stimulates respiration without stimulating the cough reflex. Heyd⁽²⁾ reports its use with nitrous oxide or ethylene as the supplemental anæsthetic in thirty cases and says the results were excellent both in toxic goitre and in abdominal surgery. Dr. Voss, of the Pathology Department of Sydney Hospital, estimated the blood sugar of fifteen patients who had "Sodium Amytal" administered intravenously. One patient showed a rise of 70 milligrammes *per centum* three hours after induction. All the others had negligible alterations at the end of a similar period. "Sodium Amytal" is not often used without morphine, but when morphine is not used, the pupils remain moderately contracted.

Post-Anæsthetic Effects.

Individuals show great variation in the period of sleep following operation. In some cases unconsciousness persists for twelve hours, the majority will respond to questions in three to six hours, but memory does not function until twelve to eighteen hours later, for example, a patient may converse drowsily in the evening following operation and not be mindful of the visit next day. Approximately 20% are restless during recovery; one man persisted in patrolling the ward eighteen hours after operation, but small injections of morphine are usually sufficient to maintain control. Vomiting is rare, even after the administration of several ounces of ether. One patient vomited profusely two days after operation and on the third day experienced a generalized urticarial eruption. Later she was found to have radiological evidence of hydatid cysts in the wall of the right ventricle. One patient experienced transient diplopia on the day following operation.

Lundy stresses the liability to pulmonary œdema and bronchopneumonia as a result of prolonged immobility and diminished pulmonary ventilation, when large doses are given. Several writers have advocated the use of carbon dioxide as a routine respiratory stimulant before the patient leaves the operating table. In operations on the mouth and upper respiratory passages the use of "Sodium Amytal" is not advocated because of the long period of diminished consciousness which follows. Unless vigilant nursing is maintained, hæmorrhage may become alarming before notice is given. One patient who underwent turbinectomy was ashen grey and almost pulseless three hours after operation.

There have been six deaths among my series, as follows:

A female, aged sixty-eight years, with a perforated gastric ulcer, had an enlarged heart. She died four days later of heart failure. She had a cardiac psychosis in the interval.

A male, aged seventy-six years, was submitted to prostatectomy. Cerebral hæmorrhage occurred three days after operation.

A male, aged seventy-three years, suffered from gastric carcinoma and extreme arteriosclerosis. He died on the third day after the occurrence of pulmonary oedema.

A female, aged seventy years, was deeply jaundiced for six weeks prior to cholecystectomy. Excessive hæmorrhage occurred. Death resulted twelve hours after the operation.

Two patients died after thyroidectomies for Graves's disease. Both were very "toxic." Death occurred approximately eighteen hours after operation.

In all these cases I feel that the choice of anæsthetic contributed very little, if at all, to the cause of death.

Obstetrical Usage.

Dr. L. Abramovich and I have employed "Sodium Amytal" in ten obstetric cases. It has been given orally in each instance. Four or five 0.18 gramme (three grain) capsules are given when the cervix is half dilated. In three cases an additional three capsules were given in four to five hours. In all there was diminished consciousness; four patients required inhalation anæsthesia for the birth, but did not remember it being given. In two instances the infants were cyanosed, but artificial respiration was successful. As a rule the patient sleeps between pains, but awakens during contractions. Memory of pain is greatly diminished afterwards.

Advantages.

The advantages of "Sodium Amytal" are:

1. Apprehension is allayed before operation.
2. The stage of excitement during induction is deleted.
3. Lessened amounts of anæsthetic for inhalation are required.
4. Post-anæsthetic nausea and vomiting are absent.
5. Less morphine is required after operation, except for a few restless patients.
6. In the case of the isolated country practitioner minor surgical procedures may be carried out under "Sodium Amytal" alone.
7. "Sodium Amytal" has a distinctly useful field in obstetrics.

Conclusions.

"Sodium Amytal" is a very satisfactory basal anæsthetic. It may be administered before the patient leaves the ward. Dosage is more easily calculated and the effects are more certain when the drug is administered intravenously. No stated

minimum dose can be relied upon to produce a given effect. Its use is not advisable in very old or debilitated persons. Large doses are seldom indicated; sufficient has been given when pinching the skin fails to elicit a motor response.

Full surgical anæsthesia is best maintained by an anæsthetic which can be varied from moment to moment as occasion demands.

Barbital and its derivatives are excreted by the kidneys, approximately three days elapsing before excretion is complete.⁽³⁾

Acknowledgements.

My thanks are due to Charles Markell and Company, agents for Eli Lilly, for supplies of the drug, and to the surgical staff of Sydney Hospital, especially Dr. R. I. Furber, for permission to administer it to patients under their care.

References.

- ¹ J. S. Lundy: "Intravenous Anæsthesia; Particularly Hypnotic Anæsthesia and Toxic Effects of Certain New Derivatives of Barbituric Acid," *Anæsthesia and Analgesia*, September-October, 1930, Volume IX, page 210.
- ² C. G. Heyd: "Anæsthesia and Analgesia, by Intravenous Administration of Sodium Amytal," *American Journal of Surgery*, July, 1930, Volume IX, page 29.
- ³ L. A. Emge and P. E. Hoffmann: "Clinical Observations on Relation of Sodium Amytal to Vasomotor and Diuretic Phenomena after Oral Administration," *American Journal of Surgery*, July, 1930, Volume IX, page 16.

Reports of Cases.

SOME PERSONAL EXPERIENCES WITH "AVERTIN" ANÆSTHESIA.

By HYAM M. OWEN, M.B., Ch.M.,
Sydney.

THE advent of "Avertin" as a basal anæsthetic is still sufficiently recent in Australia to render interest in a personal experience of its use.

It has been my misfortune to have had to undergo the experience of being anæsthetized on five occasions; once with ether by the closed method, once with ether by the open method, twice with the ethyl chloride-ether sequence, and once with "Avertin" followed by a small amount of closed ether.

When it came to having the third anæsthetic I certainly did not relish the prospect, and my approach to the fourth, after a vain effort to dodge it altogether in favour of local anæsthesia, was made with great reluctance. There is no doubt in my mind that the experience of undergoing induction with and recovery from ether or ethyl chloride followed by ether causes a definite amount of hesitation to repeat the experience, if not an actual dread of it.

Having administered the several different anæsthetics and combinations of anæsthetics in common use, and having administered "Avertin" followed by ether on several occasions, I submitted to operation a few weeks ago under "Avertin" with a ready willingness.

The operation was appendicectomy and left inguinal herniotomy. The dose administered was 0.125 gramme of "Avertin" per kilogram body weight, in which were mixed 30 cubic centimetres of 20% sulphate of magnesia solution and one cubic centimetre of "Narcophin." I was subsequently told that 30 cubic centimetres (one ounce) of ether were given during the operation. This was given after the herniotomy was completed and during the skin

incision for the appendicectomy. I had had a light breakfast at 5.30 a.m. The administration of the rectal anæsthetic was commenced at 7.40 a.m.

I will now describe my sensations under the influence of this drug and briefly compare with previous experiences as I proceed.

My sensations were, as I described at the time, a feeling of "wooliness" of the skin—a pleasant feeling.

This sensation began in about one minute after the commencement of the rectal injection. In two minutes, as far as I could judge, I was asleep without appreciating the fact and knew no more till I awoke. I was afterwards told by the anæsthetist that at this stage the total amount of "Avertin" had not yet been injected. Also he states that I answered a question proposed to me after three minutes and I did not appear to be asleep until after four and a half minutes had elapsed from the time of commencement of the introduction of the rectal injection. However, I have no recollection of consciousness after the first two minutes. There were no sensations of falling or of being overwhelmed or of being suffocated, as in previous anæsthetics.

The awakening to which I refer is that of which I retained a definite memory and not to any previous return to consciousness, subsequently forgotten.

I was told that the time was 5.30 p.m. This return to consciousness was just like waking from natural sleep—a pleasant sensation and devoid of all loss of orientation which was associated with previous anæsthetics. However, without knowing it, I again lapsed into sleep and awoke pleasantly at 8 p.m. From then onwards my consciousness was perfectly clear, but there existed a general feeling of elation. I persisted in declaring I was fit and in no pain, expressed a readiness for food and demanded visitors, all of whom I immediately recognized, though I knew I was not yet quite awake. At no time was I nauseated, nor was there any vomiting, headache, dry throat or stiffness in the jaw, previously experienced after ether.

There remains now an interval to be described. What happened after my return from the theatre and until 5.30 p.m.? I am told that I remained quiet until 1.30 p.m., then began to move. I first spoke at 2.45 p.m. From then until 5.30 p.m. I slept and awoke at short intervals. Some of the intervals of wakefulness were completely forgotten; for example, at 4.45 p.m. I had some tea and bread and jam, all of this being so completely forgotten as to have been stoutly denied by me afterwards, whereas other incidents were recalled.

I was "out" of the "Avertin" by 3.30 p.m., that is, approximately eight hours after the rectal injection, and "out" of the analgesic stage two hours later.

Dr. Blomfield and Dr. Shipway have stated in their report on the use of "Avertin" in anæsthesia, published in *The Lancet* of March 16, 1929, that the long period of freedom from pain during this stage of analgesia and amnesia is "often" an advantage. In my own case I am quite sure it was a definite advantage and am very grateful for it, for when the effects of the "Avertin" had completely disappeared, the abdominal discomfort made its presence felt.

In conclusion, my opinion, based on my administration of it to others and on experiencing it myself, is that "Avertin" is an ideal anæsthetic for induction purposes and, owing to the small amount of ether used in conjunction with it, as well as to its own properties, it gives such freedom from harmful after effects, that its use, from the point of view of the patient, the surgeon and the nurse, should rapidly become general.

Reviews.

ANATOMY AND SURGERY.

PROBABLY the most difficult period of the medical course is the interval, usually in the fourth year, between the passing of the anatomy examinations and the acquisition of a sufficient knowledge of pathology to enable the student

to appreciate the clinical material in the hospital. In order to bridge this gap and at the same time keep the elements of anatomy fresh in the student's mind, L. Bathe Rawling has written a splendid little book entitled "Stepping Stones to Surgery."¹ As the name implies, it leads from one subject, anatomy, to the other, surgery. The book consists of a series of lectures delivered at Saint Bartholomew's Hospital on clinical applied anatomy. The author is well known to most students of anatomy for his "Landmarks and Surface Markings of the Human Body," a book which has proved invaluable to a generation of medical students and practitioners.

Thirty-one cases are considered, each in the form of a clinical lecture; the salient features in the history and physical signs are dealt with and the anatomy of the region concerned is described in such a way that even apparently unimportant details are made interesting in their application to the condition in question.

The chapters on injuries and diseases of bones and joints are particularly useful, as some of the illustrative cases are examples of indifferent results. The reasons for these are explained with reference to the detailed anatomy of the parts involved.

The student is stimulated to a lively interest in such apparently dull matter as the shape and articulations of the small bones of the wrist, as the author invests each part with a real significance, the appreciation of which can alone insure correctness in diagnosis and skilful treatment. The long clinical experience of the author is evident in such descriptions as that of the so-called "prostatectomy." How many medical practitioners have puzzled their brains in their early years of surgical study over the capsules of the prostate? Some clinicians would not perhaps agree entirely with the author in the explanation of radiation of pain in ureteral colic. The part played by the autonomic system has escaped his attention.

The illustrations of which there are ninety-seven, are excellent and enhance the value of the book. They are simple and in some cases diagrammatic, which fact, while occasionally detracting from their accuracy, renders them more easily understood and forcibly drives home the point at issue. A few departures from current anatomical description are probably explained by the author's attempt to render the book as small as possible. The difficulty of injecting the Gasserian ganglion by the lateral approach usually described is one of the many examples of the up-to-date clinical methods presented.

The book can be recommended as an invaluable aid to students commencing their hospital work, especially as a companion to a text book of regional applied anatomy. In our opinion it is the most helpful book of the kind that has appeared since the late James MacKenzie published "Symptoms and Their Interpretations."

CHRONIC ARTHRITIS.

As Dr. A. H. Douthwaite, the author of "The Treatment of Chronic Arthritis," points out, descriptions of the pathology and clinical aspects of the various forms of this condition must be an essential part of any book whose primary object is to outline forms of treatment.² A statement of this kind applies more forcibly to the literature which has sprung up about chronic arthritis than to any other branch of medical literature. So many qualifications have been adopted and so many methods of treatment which had failed to survive the test of more recent knowledge, have persisted in current literature that it is refreshing to find a small hand book written by an author who has the courage to discard many of these more comfortable beliefs.

We think that the author's idea of the pathology underlying the various types of arthritis described in his book

¹ "Stepping Stones to Surgery (Anatomy Applied to Surgery)," by L. B. Rawling, M.B., B.Ch., F.R.C.S.; 1930. London: H. K. Lewis and Company. Demy 8vo., pp. 244, with 97 illustrations. Price: 12s. 6d. net.

² "The Treatment of Chronic Arthritis," by A. H. Douthwaite, M.D., F.R.C.P.; 1930. London: Jonathan Cape; Sydney: Angus and Robertson. Crown 8vo., pp. 128. Price: 6s. net.

fails to express adequately the more recent advances in this branch of the subject, but nevertheless this portion of the work will do much to assist the general practitioner across that very difficult area of "no man's land" which he must traverse when he attempts to bring his knowledge of this subject into line with current ideas. The fact that the book has been written with the object of assisting the general practitioner warrants a somewhat didactic treatment of the subject, but the necessity of keeping the subject matter within a limited scope has evidently prevented the author from discussing fully many theories which have been of assistance in shedding light on the more abstruse problems of the condition.

It is refreshing to observe the influence of the monumental work of Pemberton on the ideas expressed in this book and if for nothing else we would commend this work to the general practitioner. The author lays stress on the necessity of rigid adherence to a suitable diet, on the instability of the vascular system, the paramount importance of the prevention of contractures, the value of muscle group reeducation and manipulation, the metabolic problems associated with these diseases and, above all, the necessity of the treatment of the patient as a whole in addition to the treatment of the joints affected.

The discussion of focal sepsis and the part it plays in this disease is rather conservative, but will be of real value in enabling the physicians to avoid "that habit of mind which finds sepsis where it does not exist." We still feel, however, that where sepsis does exist, its elimination is of paramount importance as a preliminary to other measures in dealing with this disease. The author discusses the problem of vaccine therapy very fully, but has overlooked some of the more recent advances in this method of treatment which certainly hold out hope of a greater measure of assistance to unfortunate sufferers from this complaint.

With these limitations it is a really excellent work and as a hand book of treatment should be studied carefully by every practitioner and student.

DERMATOLOGY.

DURING the last few years there have been published many works on the diagnosis and treatment of skin diseases, and another has just been added to the list, this time by Dr. G. C. Andrews, entitled: "Diseases of the Skin."¹ It is one of the best books published on the subject, certainly one of the best from the United States. It is up to date and a real text book, and Dr. Andrews deserves great commendation.

The book is divided in the usual way into many chapters with a full index at the end. In this volume of little more than a thousand pages there are nearly a thousand illustrations, besides many useful diagrams showing technique, apparatus *et cetera*. The photographic illustrations are excellent. At the end of each chapter are appended numerous references, which is good evidence that Dr. Andrews has taken great care to produce such a useful book.

We can thoroughly recommend this work to all specialists in diseases of the skin.

A HAND BOOK ON TROPICAL MEDICINE.

FOR some time there has been need of a concise and short text book on tropical medicine, in other words, of what might be truly described as a hand book on this subject. Such hand books on tropical medicine have existed in the past, but as these have become older, and as edition has succeeded edition they have acquired the disabilities of age, an increase of weight and size and, it

must be confessed, very often a certain amount of unnecessary padding.

The appearance of a work on tropical medicine by two such authorities as Sir Leonard Rogers and Major-General Megaw, which is truly a hand book, is therefore all the more welcome.²

While this work is small and concise, it embodies all essentials and contains latest methods of diagnosis and treatment. It is excellently printed and illustrated. The chapters on leprosy and ankylostomiasis are particularly good, and it is noted with satisfaction that attention has been paid to the importance of distinguishing between hookworm infection and hookworm disease.

The book can be confidently recommended to students and practitioners alike and should command a wide circle of readers.

Notes on Books, Current Journals and New Appliances.

THE WIRE SPLICE.

MEDICAL practitioners are physicians, surgeons, general practitioners or followers of some specialty. In their leisure they are golfers, gardeners, mountaineers, yachtsmen and what not. Those that go down to the sea in sail-clad vessels are the most devoted of devotees. One of their number, Dr. R. Scot Skirving, an old "Comway," has published a booklet on wire splicing which will be useful to all yachtsmen, whether they are followers of Æsculapius or not.³ To the non-nautical person wire splicing is as remote an occupation as intestinal anastomosis is to the non-medical. It appears, however, to be as important to the sailor as the intestinal procedure is to the surgeon. In this little book the author has described the eye splice, the short splice, grommet making and the long splice. His inimitable and charming style is evident, and we note that medicine is brought to the aid of seamanship in a skigram of an eye splice on the frontispiece. The drawings and photographs are clear and we can imagine even a non-nautical person making quite a presentable splice with the aid of this book.

THE AUSTRALIAN AND NEW ZEALAND JOURNAL OF SURGERY.

THE first number of *The Australian and New Zealand Journal of Surgery*, hitherto known as *The Journal of the College of Surgeons of Australasia*, has been published. The new journal has the same general appearance as its predecessor and the paper and make-up are similar. In this issue there is a lengthy article on the technique of the Wertheim operation, by Victor Bonney; the article is illustrated by nineteen line drawings, in which the steps of the operation are clearly shown. E. S. J. King writes on the association of ovarian neoplasms with endometrial hyperplasia, and R. A. Willis on metastatic tumours in the intestines. E. D. Ahern discusses the peptic ulcer problem in a way that should be helpful to both surgeons and physicians. J. M. Buchanan contributes a useful article on fractures of the lower limb; he makes special reference to bony traction. N. D. Royle writes on *hallux valgus* and *hallux rigidus*, and James R. Bell on surgery in diabetics. There are case reports on intrabiliary rupture of an hepatic hydatid cyst, radium treatment of carcinoma of the soft palate, carcinoma of the jejunum and fibroma of tendon sheath, by B. T. Zwar, E. G. Anderson, Alan Newton and R. J. Wright-Smith respectively.

¹ "Churchill's Empire Series: Tropical Medicine," by Sir Leonard Rogers, C.I.E., M.D., B.S., F.R.C.P., F.R.C.S., F.R.S., and John W. D. Megaw, C.I.E., V.H.S., B.A., M.B., B.Ch., B.A.O.; 1930. London: J. and A. Churchill. Royal 8vo., pp. 544, with illustrations. Price: 14s. net.

² "Wire Splicing for Yachtsmen," by R. Scot Skirving; 1931. Sydney: The Australasian Medical Publishing Company, Limited. Demy 8vo., pp. 34, with illustrations.

³ "Diseases of the Skin: A Text-book for Practitioners and Students," by George Clinton Andrews, A.B., M.D.; 1930. Philadelphia: W. B. Saunders; Melbourne: James Little. Crown 4to., pp. 1101, with 988 illustrations. Price: 66s. net.

The Medical Journal of Australia

SATURDAY, JUNE 20, 1931.

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References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: Initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction, are invited to seek the advice of the Editor.

THE MEDICAL CURRICULUM AT THE UNIVERSITY OF SYDNEY.

SINCE the first number of this journal appeared in July, 1914, the medical curriculum at the three Australian universities has been discussed on many occasions. A careful study of the subject was made in 1920, when a report was submitted by a committee which met at the invitation of the Editor, the late Henry William Armit. The attention of those interested in medical education had been drawn to the need for reform by a report of a special committee of the Edinburgh Pathological Club. The members of the committee of this journal who signed the report, were Archie Aspinall, H. G. Chapman, J. L. McKelvey, Harold J. Ritchie, F. P. Sandes and S. A. Smith. The burden of the report was that the old plan must be abandoned, that the new scheme must be built on the principle that all medical knowledge is based on a special adaptation of chemistry, physics and biology to the study of health and disease and that the student must be taught these applied sciences in association with the special branches of clinical medicine and pathology. The systematic lecture was condemned in principle and was to be restricted to a minimum

in practice. It was held that the aim of medical education was not to prepare students to pass examinations, but to prepare them to acquire knowledge in such a manner that after a period of five years they would be competent to continue the process of learning without the guidance of teachers and without the necessity of attending classes and clinics. Apart from this report, stress has been laid in these pages on the need for the appointment of professors of medicine, surgery and preventive medicine and of professors of obstetrics, on the importance of adequate clinical teaching and on the prevention of overlapping. Many of the reforms here mentioned, and others not mentioned, have been brought about, some in one university, some in another. Many imperfections, however, still exist or have existed until quite recently, and the greatest of these is lack of correlation in teaching. There is a curious hesitation on the part of most university authorities to undertake the complete adjustment of a medical curriculum. The changes effected are generally a patchwork; they are reminiscent of a man with a home that is antiquated and unsuited to modern needs, who adds a room here, knocks down a wall there, installs modern conveniences too large for the premises and adds a storey when the foundations are insecure, instead of pulling the structure down and laying new foundations capable of carrying the necessary fabric.

At the University of Sydney a unique opportunity for complete revision of the curriculum has arisen. Whole-time professors have been appointed in medicine and surgery and the Rockefeller Foundation has given a sum of £100,000 for the erection of a building to be used for teaching purposes in the ground of the Royal Prince Alfred Hospital. The best use has been made of the opportunity and the result is the most complete curriculum within our knowledge; it probably leaves less to be desired than any curriculum extant. The whole course of six years has been divided into two periods of three years. The first period is devoted to the study of biology, chemistry, physics, anatomy and physiology *et cetera*. There has been no alteration in this part of the course, except that pharmacology

is being closely allied to therapeutics and *materia medica* in the fourth year. The student will not regard anatomy and physiology as subjects which have no bearing on medicine; the students will occasionally be taken to the wards for demonstrations in applied anatomy and physiology. It is, of course, equally essential that in the later clinical years the bearing of chemistry, physics and biology on the manifestations of disease be not forgotten; without this correlation clinical teaching is sterile. The fourth year will be devoted to the study of pathology and bacteriology, to general semeiology and general therapeutics. The fifth year will be given up to the study of nosography, special semeiology and special therapeutics. The sixth year will be spent entirely in the wards and will be concerned mainly with differential diagnosis. The most important point about the whole arrangement is that the subjects will not be taught as though they existed in water-tight compartments. The teaching will be correlated. Thus the study of medicine begins simultaneously with that of surgery in the fourth year. Lectures will be so arranged that the student will be able to grasp the subject as a unified whole. While, for example, the bacteriologist lectures on infection and the pathologist on inflammation and repair, the surgeon will be dealing with wounds and sepsis, the physician with pain and fever and the pharmacologist with anti-septics and antipyretics. This kind of correlation will be carried on throughout the course. The fourth year work in medicine and surgery is entirely introductory; it will deal with general principles and not with specific diseases. Tutors have been appointed, four in each subject. The students will be taken in groups of eight or ten and at the end of the fourth year each student will have been taught twice a week by his own tutor, he will have learned the general principles of his subject and will know the general methods of examination. The special subjects—ophthalmology, oto-rhino-laryngology, dermatology and so forth—are introduced at the appropriate times in the general courses of medicine and surgery, according to whether their approach is semeiological or nosographical. Obstetrics, psychiatry and gynaecology,

are dealt with in the fifth year. Systematic lectures are given in medicine, surgery, obstetrics, preventive medicine and psychiatry, but their number has been reduced. All the instruction in children's diseases is given at the Royal Alexandra Hospital for Children and in infectious diseases at the Coast Hospital. The time-table is so arranged that the student has every afternoon free for clinical work. Though no lectures in pathology are given after the fourth year, it is intended that pathological clerks shall be appointed from among the students. The proximity of the new building to the hospital wards will make the systematic lectures of more practical use, for clinical exhibits will be available and will be introduced—lecture theatre, museum and wards will be used as occasion arises.

The foregoing is admittedly a brief and inadequate description of the new arrangements. It will suffice to show the principles on which the work has been planned. At a later date a more detailed description will be given. It must be pointed out that, although the new building has not yet been erected, the curriculum is working smoothly. The members of the honorary staffs are cooperating to make the scheme successful. The Dean and the Faculty of Medicine are to be congratulated on having broken so far away from tradition, and the Senate on having accepted the recommendations of the Faculty. It seems to us particularly fitting that so large a part should have been taken in the drafting of this curriculum by Professor C. G. Lambie. Professor Lambie has but recently come from Edinburgh, and it was the Edinburgh Pathological Club which aroused interest in medical education a little more than a decade ago. Whether the ideal curriculum has been planned remains to be seen. We rather suspect that the number of didactic lectures is still greater than those who drafted the curriculum would have wished. If this be so, they have our sympathy. In time, no doubt, the remaining conservatism of the Senate of the University of Sydney will give way to the essential liberalism of the teaching and profession of medicine. The eyes of the medical world will be focused on the Medical School of the University of Sydney for the next few years.

Current Comment.

BLOOD TRANSFUSION AND SYPHILIS.

EVEN with the exercise of the greatest care as regards compatibility and other factors, the transfusion of blood is not entirely without hazard. The effects of drugs administered to the donor may be transmitted to the recipient. Diseases such as measles, malaria and variola have been similarly passed on. When technique has been careless, fatal blood infection has been transmitted from the ailing recipient to the donor. Of all the diseases transmitted through the agency of blood transfusion syphilis is, perhaps, the most to be feared. S. H. Polayes and Max Lederer have given an account of all such catastrophes recorded.¹ In 1917 B. M. Bernheim reported the transmission of virulent syphilis from a son to his father, who was suffering from pernicious anæmia. The son was aware of the fact that he had syphilis and refused to have a Wassermann test performed. In 1923 W. V. Brem cited two instances of syphilis being thus transmitted to patients suffering from pernicious anæmia. Each donor failed to react to the Wassermann test a month before the transfusion. In 1926 L. Spillman and Morel recorded an instance in which the donor was infected from the patient. A medical practitioner acted as donor and became infected by interchange of the cannulæ. In 1927 Levy and Ginsberg reported the infection of a father who was suffering from pernicious anæmia, by blood transfusion from a syphilitic son. In 1928 Feldman reported infection of a widow by blood transfusion. The donor gave no reaction to the Wassermann test nineteen days before the transfusion, but reacted four months later. Several cases of a more or less similar nature are quoted.

The case reported by Polayes and Lederer is that of a male child of seventeen months suffering from *otitis media*, tonsillar abscess and cervical adenitis. Both parents failed to react to the Wassermann test on two occasions. The child had a transfusion of 150 cubic centimetres. Three and a half months later the mother noticed a rash on the child. When the child was readmitted to hospital five months after transfusion there was a copper-coloured macular eruption over the whole body—an atypical secondary syphilide—with general glandular enlargement. The Wassermann reaction was twice strongly positive, but the parents still failed to react. The donor could not be identified, as the blood had been obtained from a bureau, where it was admitted, however, that at that time a donor had been excluded because his blood was found to give a positive reaction to the Wassermann test. The child had no primary lesion and the parents knew of no syphilitic person with whom the child had come in contact. The writers mention two other cases of transmission of syphilis by blood transfusion, one of the infected persons being a child.

It is not always easy and may be impossible to prove that a donor had syphilis before transfusion and the patient had not. In the present state of our knowledge it is impossible categorically to assert that he or she is non-syphilitic, even if clinical signs are absent and the blood fails to react to Wassermann tests. Tzanck and Werth relate the history of a female donor with no evidence of syphilis whose blood failed to react to the Wassermann test six times in three years; she gave her blood eighteen times within that period without any evidence of infecting the recipients. Five months after her last donation she became hemiparetic with icterus and a positive Wassermann reaction. The clinical signs disappeared and the blood failed to react after arsenical therapy. It would be of great interest to know if any of this woman's recipients later gave evidence of syphilis. If not, it would support W. L. McNamara's theory that donors with tertiary syphilis may be used with safety for blood transfusions and that their blood will not infect the recipient. McNamara made a series of transfusions in which non-syphilitics were given blood from patients with tertiary syphilis. One patient received blood from three different sources. None developed clinical or serological evidence of syphilis during observation from sixteen to twenty-six weeks.

In determining whether syphilis was transmitted by transfusion it must be remembered that syphilis without a chancre and inguinal adenitis is not often acquired by other than the hæmatogenous route. This is not invariably so, as urethral chancre in the male and vaginal chancre in the female may be overlooked by the patient. Inguinal lymphadenitis may be due to causes other than syphilis. Extragenital chancre, as of the lips, may be innocently acquired and not referred to syphilis by the sufferer. A rigorous examination must be made of all donors as regards history of exposure and inspection must be made for chancre in unusual parts as well as for all other clinical manifestations of the disease. A history of exposure should make all examinations especially stringent. Possibly cases have been transmitted other than those mentioned in this article. To disseminate syphilis by therapeutic transfusion is a calamity of the first magnitude. Not only professional but also family donors should be carefully investigated. "Blood relation does not exclude or excuse the transmission of so dreadful a blood infection." In spite of McNamara's experiments, it would be wicked to employ donors in the tertiary stage of syphilis. No blood test will positively exclude syphilis. The Hinton glycerol-cholesterol reaction for diagnosing the primary stage of syphilis is considered by some to be especially sensitive and valuable. B. S. Levine has stated that the "serum of donors must be tested on at least three occasions and by as many laboratory procedures as possible. One set of tests shall be performed immediately preceding the transfusion. The tests shall include one warm incubation, one cold incubation and one precipitation procedure."

¹ *The American Journal of Syphilis*, January, 1931.

Abstracts from Current Medical Literature.

DERMATOLOGY.

Dermatitis Due to Sensitization to Contact Substances.

B. KESTEN AND E. LASZLO (*Archives of Dermatology and Syphilology*, February, 1931) describe their observations on the use of the "patch test" in a series of patients suffering from *dermatitis venenata*. The method employed was the one described by Jadassohn. In making the patch, the centre of a four centimetre square of adhesive tape is protected with a three centimetre square of "Cellophane" or "Silkoid" (to prevent an adhesive tape dermatitis) and on the centre of this is placed a one centimetre square of four-ply gauze which is well covered with the substance to be tested. The test is applied to the upper posterior part of the chest which has previously been cleansed with alcohol. The result of a test is considered positive when a well defined infiltrated inflammatory area covered with vesicles or bullæ occurs at the site after twenty-four hours. The reaction may, however, be delayed up to forty-eight or seventy-two hours and may persist from three to fourteen days. In performing these tests it is necessary to know the concentration of the substances that may be used without irritation to the normal skin. A list of concentrations of substances studied has been given. In eighteen of a series of twenty-one patients suffering from *dermatitis venenata* or occupational dermatitis the aetiology was substantiated by patch tests. In the remaining three there was an exacerbation of the dermatitis when the substances were applied to the sensitized skin. In all of the cases there was freedom from dermatitis when the specific substance was avoided. Passive transfer of sensitization was unsuccessful.

Tinea Barbae Accompanied by Dermatophytia.

C. M. WILLIAMS (*Archives of Dermatology and Syphilology*, February, 1931) describes a case of tinea affecting the beard region and also the upper lip. The general symptoms were pronounced. The author calls attention to the obstinacy of the condition compared with kerion of the scalp. There was a condition of onychogryphosis of several of the toe nails with mycelium present. During the course of the disease typical lichenoid dermatophytia broke out over the whole trunk which lasted only a few days. The patient was treated with lotions and two half-pastille doses of X rays, but the condition was exceedingly rebellious until injections of compound solution of iodine were given intravenously, after Ravant. A solution made up of iodine one gramme sodium iodide 10 grammes, water 100 grammes, was used. One half to one cubic centimetre of this

solution is used together with ten cubic centimetres of a 20% solution of sodium thiosulphate.

Verruca Plantaris.

J. NEWTON SISK (*Radiology*, November, 1930) states that radiologists and dermatologists are beginning to attach more importance to various types of callosities of the feet than they did four or five years ago, when very little was written on the subject. *Verruca plantaris* usually occurs on the anterior half of the feet. The author's study of fifty-three patients successfully treated by X rays has convinced him that the condition is not limited by age, sex, colour, race or occupation. The author uses unfiltered radiation limited to the bounds of the lesion for twice the time required to produce a mild erythema on the flexor surfaces, followed, if required, in three weeks by a dose of one and a half erythema intensity. Because of the complete cure of the disease without pain or disability, X ray treatment is considered the method of choice.

Phytopharmacology of Pemphigus and other Dermatoses.

I. R. PELS AND D. I. MACHT (*Archives of Dermatology and Syphilology*, April, 1931) state in their first communication on the subject of phytopharmacology of pemphigus and other dermatoses that the discovery of a characteristic toxicity for plant growth in the blood of patients with pemphigus was an accidental observation in connexion with the examination of 250 specimens of various dermatoses. In this report the test was applied to 60 additional cases of pemphigus. Syphilis, eclampsia, pellagra, active pulmonary tuberculosis and other conditions have shown no toxicity. In a number of cases the serum of lepers was found to be very toxic. The test consists briefly in measuring quantitatively the increment in the length of the straight, single, well defined roots of seedlings of the hardy plant *Lupinus albus*. The writers have been able to confirm their preliminary readings, namely, a greater toxicity for plant protoplasm as compared with that of normal serum. This toxicity is not uniform in about 9% of cases. The method apparently serves to differentiate pemphigus from typical *dermatitis herpetiformis*. *Erythema multiforme* may exhibit some toxicity at times, as measured by this procedure. A method of procuring serum by solid carbon dioxide snow is described.

"Bismarsen" in the Treatment of Syphilis.

J. H. STOKES, T. H. MILLER AND H. BEERMAN (*Archives of Dermatology and Syphilology*, April, 1931) present a report on the use of bismuth arsenamine sulphionate based on seven thousand injections in three hundred cases during five years. The dose for adults is 0.1 to 0.2 gramme given intramuscularly. The drug is dissolved in one cubic centimetre of water containing butyn as a local anaesthetic. Local reaction occurs fol-

lowing 2% of injections, as stiffness and moderate pain are most pronounced on the second or third day. Prolonged massage and hot applications control all but 8.2% of these reactions. Systemic reactions occur in 0.5% of injections. The effect on the response to the Wassermann test in early syphilis is excellent and lasting. The proportion of all forms of relapse was 12% in early syphilis as compared with from 20% to 40% in a carefully studied series treated with other drugs. It would appear that the field of greatest promise for this drug is early syphilis. The writers suggest that two injections should be given per week without rest intervals until forty injections have been given.

Intraepidermal Carcinoma of the Skin.

L. SAVATARD (*The British Journal of Dermatology and Syphilis*, April, 1931) reports the study of a number of cases of carcinoma of the skin, and states his views and conclusions. He suggests that Bowen's disease is, in spite of Darier's pronouncement, identical histologically with the extramammary lesions of Paget. His thesis is summarized as follows: (1) Epidermic carcinomata of the skin, whether of the basal, squamous or mixed type, are initially confined to the epidermis and are therefore intra-dermal carcinomata. (2) Intradermal carcinomata may (a) remain within the epidermis indefinitely, when they present the clinical features of so-called benign erythematoid carcinoma of Little, or (b) they may atrophy, or (c) they may break through the basal layer, infiltrating the corium and deeper tissues, when they present the clinical picture of the usual rodent ulcer or epithelioma. (3) Bowen's disease, the so-called senile keratosis of the face, senile keratosis on the backs of the hands, keratosis on lupus scars *et cetera* are clinical manifestations of carcinoma and are not therefore precarcinomata.

UROLOGY.

Vegetative Syphiloma of the Bladder.

L. F. AJAMIL (*The Journal of Urology*, January, 1931) describes syphilitic lesions as they are found in the bladder. Difficulty in diagnosis is noted in most of the published cases owing to the comparative rarity and extreme variety of manifestations of this affection. In this instance the diagnosis was established by the failure of usual methods of treatment of cystitis, the variation in the cystoscopic findings from those due to other diseases, and finally by the discovery that the spinal fluid showed a luetic curve in response to the Lange test. Wassermann and Kahn tests gave no reaction. Response to treatment was immediate and well maintained, definite changes being noted within a few days of the first injection of "Novarsenobillon" and the patient being symptomless after the fifth dose. The prostate, which was also involved,

reacted much more slowly, but eventually just as completely as the bladder.

Gonococcal Pyelonephritis.

F. J. PARMENTER, A. G. FOORD AND C. S. LEUTENEGGER (*The Journal of Urology*, October, 1930) review the literature and report four additional cases of gonococcal pyelonephritis. Thorough laboratory tests were carried out to exclude any other aetiological organism. In no instance was the treatment entirely successful. Oral and topical medication had only a palliative effect and the one patient for whom nephrectomy was performed still had pyuria on discharge. No features characteristic of the gonococcus were found on cystoscopic examination or in the kidney which was removed. The authors conclude that Neisserian renal infection is characterized by extreme chronicity and is influenced only to a slight degree by medical treatment.

Pathological Changes in Horseshoe Kidney.

D. R. MELEN AND L. GASPAR (*The Journal of Urology*, January, 1931) record a combination of squamous-celled carcinoma with calculous pyonephrosis in a horseshoe kidney. After discussing the aetiology and pathological conditions of horseshoe kidney, the authors draw attention to the fact that a large percentage escape preoperative diagnosis; they indicate the diagnostic radiological findings. In the case reported nephrolithotomy was performed and the patient succumbed to septicæmia due to a hæmolytic streptococcus, the horseshoe kidney and squamous-celled carcinoma of the pelvis being found *post mortem*. Some of the regional lymph glands showed metastatic deposits of identical structure with the primary growth.

Double Renal Pelvis in Longitudinal Axis.

A RARE renal abnormality is reported from the Mayo Clinic by H. C. Bumpus, Junior (*The Journal of Urology*, January, 1931). This is a duplication of the renal pelvis on its longitudinal axis, the usual division being transverse. Illustrative pyelograms from the author's case and one previously reported are reproduced.

Plastic Ureteric Surgery.

WITH a very frank consideration of his own cases, J. K. Ormond (*The Journal of Urology*, February, 1931) includes an exhaustive review of the published opinions of numerous American and Continental urologists concerning the plastic surgery of the ureter. The survey is made for the benefit of surgeons who rarely encounter such cases and whose choice of operation is guided by the results of others more experienced. With regard to the upper part of the ureter, from a maze of conflicting evidence he evolves the conclusions that such operations are justified by results, but the technique must be determined by the peculiarities of each case. In

addition, nephropexy is usually necessary, and it is advisable to use a ureteric catheter as a splint. When the kidney is badly damaged nephrectomy is preferred, provided the other kidney is healthy, in elderly patients and when, for economic reasons, prolonged after-treatment is impossible.

Valves in Penile Arteries.

E. W. HIRSCH (*The Journal of Urology*, January, 1931) contends that the so-called valves in penile arteries do not exist and that illustrations of sections purporting to demonstrate the valves are made from diseased arteries. He points out that in these figures there is no definite muscular structure in the valves, the intima is split or fragellated and there is no similarity in the type of valve observed. These valves are not consistently found in all individuals. On these grounds he concludes that the structures described as valves are pathological endothelial proliferations and that physiologists will have to look further afield for the explanation of erection.

Pyelitis.

T. HRYNTSCHAK (*Wiener Medizinische Wochenschrift*, September 20, 1930) considers that in the treatment of pyelitis due to *Bacillus coli* infection the best results follow thorough alkalization of the urine for three days succeeded by ammonium chloride and urotropin given in capsule form. The only contraindications to rendering the urine acid are acute cystitis and infection of the renal pelvis or retention of urine or marked impairment of renal efficiency. When the pyelitis is due to a staphylococcal infection the author has had good results with "Neosalvarsan" in doses of 0.15 gramme given on the first, fourth and seventh days. "Spirocid" 0.25 gramme given by mouth daily for five days gives equally good results. "Neosalvarsan" has also been used in *Bacillus coli* infections while the urine is being made alkaline, and in some instances it is most valuable. Naturally, rest in bed, warm applications and regulation of the bowels are important adjuvants. Diathermy may also be employed, also intramuscular injections of blood, three to five cubic centimetres increased every second day by five cubic centimetres to a maximum of twenty to thirty cubic centimetres. In all subacute and chronic cases cystoscopy and ureteral catheterization are essential, followed by the taking of pyelograms. During pregnancy the author recommends renal lavage and the use of a retention catheter for drainage.

X Ray Treatment of Prostatic Hypertrophy.

H. BOIT (*Deutsche Medizinische Wochenschrift*, February 27, 1931) believes that X ray treatment is the best for non-operable prostatic adenoma. It is also valuable during the first stage and in cases of acute retention. Patients in the second and third stage are best treated by opera-

tion, but if this be refused, radiotherapy gives good results. The preliminary treatment of the patient is important. In toxic cases a retention catheter is used for several days. To prevent epididymitis he prefers to resect the *vasa deferentia*. Vasectomy in combination with radiotherapy gives very good results. The general condition is improved by daily doses of ten to twenty units of insulin associated with sugar by mouth or intravenously in some instances. Immediately prior to radiation ten cubic centimetres of a 50% solution of glucose are given intravenously. The testicles are shielded and on three successive days the rays are applied to various fields—perineum, between the tip of the coccyx and anus, above the *symphysis pubis*. Slight rectal and vesical tenesmus may be noted during the first days. Improvement in evacuation of the bladder is noted within a fortnight. Reduction in size of the adenoma takes a considerable time—one to five years—before any appreciable change can be detected. The end results noted in 114 cases after five years were good with more than half, moderately good and poor in equal proportions of the remainder.

Blood Pressure in Prostatism.

M. I. SENG (*The Journal of Urology*, March, 1931), in a study of the blood pressure in prostatism with regard to operability and delayed healing, comes to the following conclusions: (i) Blood pressure is an inadequate index of the condition of the cardio-vascular system. (ii) The "low blood pressure group" of patients are better "surgical risks" than the "high blood pressure group," those with normal pressures being the best of all. (iii) Cardio-vascular lesions, particularly myocardial, are responsible for the largest number of deaths. (iv) The mortality due to grave renal disease has greatly decreased in recent years. (v) Further fall in mortality is to be expected from intensive cardio-vascular examination with prolonged drainage in cases of myocardial damage.

Bacteriæmia in Urethral Operations.

F. J. F. BARRINGTON AND H. D. WRIGHT (*The Journal of Pathology and Bacteriology*, Volume XXXIII, 1930), in a study of bacteriæmia following urethral operations, find that blood invasion by organisms already present in the urine commonly occurs within a few minutes of operation. Invasion depends on the number of organisms in the urine and the degree of urethral damage. Similar invasion, which may be of a higher grade, is liable to occur after the first spontaneous micturition following operation. The route of entry appeared to be direct, rather than the more circuitous one *via* the lymph stream, as positive cultures were obtained within a few minutes. Fever is not invariable and apparently depends on the degree of the blood invasion. When a rigor occurs, it takes place after an interval, by which time the blood may be sterile, as the organisms disappear rapidly.

Special Articles on Diagnosis.

(Contributed by Request.)

L.

CEREBRAL HÆMORRHAGE.

CEREBRAL hæmorrhage and cerebral thrombosis have until recent years been described in the text books as clinical entities, widely opposed in causation, and diverging widely in treatment.

Of recent years these views have undergone considerable modification, in that it has been recognized that primary arterial thrombosis and primary arterial hæmorrhage depend invariably upon degenerative changes in the arterial wall. In fact, degenerative change in the walls of cerebral arteries is the essential factor in the production of both cerebral thrombosis and gross hæmorrhage in patients who are the subjects of arteriosclerosis or atheroma.

Cases in which thrombosis occurs as a result of abnormal conditions of the blood, or following embolism, are not included in the present review.

Ætiological Factors.

The common causes of disease of cerebral arteries which lead to thrombosis and hæmorrhage are:

Syphilis. Syphilitic arteritis is the common lesion producing thrombosis during the first half of adult life; less frequently is it the cause of hæmorrhage. Any of the cerebral vessels may be affected, involvement of the middle cerebral artery or its branches being a frequently recognizable lesion producing hemiparesis, with a variable degree of aphasia if the left middle cerebral is the vessel involved.

Atheroma. Atheromatous degeneration of the arterial walls is the common cause of vascular cerebral lesions of the later half of adult life, and is recognized as by far the commonest cause of cerebral hæmorrhage.

Aneurysm of Cerebral Vessels.

New Growth. In association with new growth of the brain, both thrombosis and hæmorrhage are not uncommon events.

Inflammatory Conditions. Inflammatory conditions, for example, hæmorrhagic encephalitis and poliomyelitis, may cause hæmorrhagic extravasation as a result of inflammation.

Trauma. Fracture of skull, severe concussion or wounds of the brain may give rise to extensive hæmorrhagic effusion.

Thrombosis (as stressed by Collier⁽¹⁾) is a much more frequent cause of apoplexy than is hæmorrhage, but survival is far more common, whereas after hæmorrhage a fatal result usually follows within a few hours or a few days of its onset.

In the presence of a cerebral vascular lesion, including cases in which there is evidence of advanced arteriosclerosis with or without renal disease and grossly increased arterial tension, thrombosis is strongly suggested when apoplexy has arisen during sleep, or while the patient was at comparative rest, or after exhaustion, exposure to cold, or debilitating conditions in general. Conditions often described as "intransigent hæmorrhage" may frequently be of this nature.

Rupture of a cerebral vessel is more likely to occur as a result of violent physical effort or exertion, mental stress or excitement, either as a primary event, or following a preexisting damage to the vessel wall resulting from a former thrombosis. When the rupture involves a large vessel the symptoms are usually sudden or fulminating in onset, and the classical picture of stroke or "apoplexy" is observed. Bleeding from a smaller vessel may be associated with a more gradual onset of symptoms, giddiness, nausea, vomiting, loss of consciousness, and signs of paralysis usually following within a short space of time. It is difficult to conceive how gross cerebral hæmorrhage can be arrested by natural processes, tearing, as it does,

the soft tissues of the brain, and usually causing rupture into the ventricular system.

From consideration of the foregoing facts, the conclusion is reached that, apart from trauma, cerebral hæmorrhage is most often a fatal occurrence, and that cerebral vascular lesions followed by recovery are, for the most part, of thrombotic nature.

Diagnosis.

When confronted with a case in which cerebral vascular lesion is regarded as the pathological basis for observed symptoms and signs, certain clinical facts should be considered.

The onset in embolism is always instantaneous. It is commonly sudden in hæmorrhage from a large vessel, but may be preceded for several minutes by prodromal symptoms when a small vessel has ruptured and the hæmorrhagic extravasation is a more gradual process.

The onset in thrombosis is more typically subacute, and more frequently commences when the patient is at rest, although massive thrombosis may occur rapidly following the separation of a small atheromatous plaque from the wall of a degenerate vessel. Transient pareses or aphasia or sensations of numbness in the limbs, commonly described as angiospastic phenomena in patients the subject of high blood pressure, are usually recognizable by their transient nature; when such phenomena are more persistent, it is probable that a minor thrombosis has occurred, surrounded by an area of cortical oedema. After the onset of vascular lesion consciousness is lost or not, according to the severity of the initial lesion and its site, and to the extent of the processes which result from the lesion, oedema following embolism and thrombosis, gross tearing of the brain tissue resulting from hæmorrhage. After cerebral hæmorrhage consciousness is lost rapidly, severe symptoms develop and usually show progressive extension. With the more insidious onset of thrombosis, loss of consciousness is likely to be gradual and may be slowly progressive.

Initial convulsion is indicative of thrombosis rather than hæmorrhage. Conjugate deviation of eyes is a feature common to all forms of apoplexy. In general, the initial lesion being irritative rather than destructive, the eyes are commonly turned away from the site of the lesion towards the paralysed side in hemiplegic cases. After a short time, however, the irritative phenomena tend to disappear, and the eyes come to deviate in the opposite direction, that is, towards the lesion (paralytic deviation).

The severity of the lesion may be estimated from: (a) Depth of the coma, (b) response to stimulation, (c) estimation of extent of alteration in reflexes and general evidence of impairment of function, (d) respiratory failure, (e) progress of symptoms.

Differential diagnosis of apoplexy from other conditions which may simulate it will usually depend on: (i) Careful consideration of the history. (ii) The presence of unequivocal signs of a local lesion of the brain. (iii) Evidence of intercurrent disease—diabetes, epilepsy, uræmia; of narcotic and other poisoning, alcoholism.

In a patient without history, when coma has reached a state sufficiently deep to obscure the unilaterality of signs of nervous lesion due to general increase of intracranial tension, the exclusion of other causes of coma may give rise to difficulty.

Uræmia is probably the most frequent cause of confusion, high arterial tension and vascular disease being common to both conditions. Variability of nervous symptoms and the subsequent course of the disease lead to accurate diagnosis. Sunstroke, cerebral malaria and sudden onset of hæmorrhagic encephalitis may cause difficulty, but careful attention to the history of onset will usually establish the diagnosis. Congestive apoplectiform attacks occurring in general paralysis of the insane are frequently mistaken for apoplexy, more particularly if the patient comes under observation for the first time during the attacks.

Head Injury. It is of the utmost importance from the medico-legal aspect to seek carefully for head injury in cases of supposed primary cerebral hæmorrhage. In a case recently observed, an erroneous diagnosis had been

made owing to failure to observe a minute bullet wound in the hard palate of an elderly man brought to hospital unconscious without history.

The apoplectiform seizures of Stokes-Adams syndrome have been mistaken for apoplexy.

Lumbar puncture and examination of cerebro-spinal fluid are useful diagnostic procedures in cases of unconsciousness, gross blood intimately mixed with the fluid being indicative of cerebral hæmorrhage. It should be remembered that "pin point" pupils are often observed in pontine hæmorrhage, and that morphine poisoning may be closely simulated. Pontine hæmorrhage, in common with sunstroke, is frequently associated with hyperpyrexia.

Apoplexy is stated never to cause death with the dramatic suddenness of heart failure; it is rare for death to ensue within two hours of the ictus.

For more detailed description of cerebral vascular lesions the reader is referred to the admirable section on this subject in "Price's Text Book of Medicine," Third Edition, 1929.

Reference.

⁽¹⁾ James Collier: "Text Book of the Practice of Medicine" (F. W. Price), Third Edition, 1929, page 1449.

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British Medical Association News.

SCIENTIFIC.

A MEETING OF THE SOUTH AUSTRALIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the Darling Building, University of Adelaide, on February 26, 1931, Dr. C. E. C. WILSON, the President, in the chair.

Myeloma of the Tibia.

SIR HENRY NEWLAND showed a male patient, aged fifty years, who was admitted to the Adelaide Hospital on August 2, 1927, with a provisional diagnosis of displaced internal semilunar cartilage of the right knee joint. The patient, who had been a sprinter in his youth, was running in a race at a picnic eighteen months prior to admission when his right knee suddenly gave way with the accompaniment of pain. Swelling of the knee followed. This yielded to treatment, but the joint had been prone to swell ever since and had been weak and had interfered with his work as a storeman.

On examination the right knee was held in slight flexion and could not be extended. There was some tenderness above the inner tuberosity of the tibia over the joint line. The history and clinical findings suggested a displaced internal semilunar cartilage. To exclude a loose body in the joint a radiograph was taken which revealed a large area of rarefied bone occupying the upper extremity of the tibia. The tibial spine was enlarged and distorted and probably caused the internal semilunar cartilage to be caught between the femur and tibia when running the race which led to his disability. The rarefaction was considered to be due to a myeloma or to a cyst.

Operation revealed a myeloma. The soft growth was curetted away as completely as possible and the cavity swabbed out with pure carbolic acid. The wound was closed and the affected region was subsequently exposed on several occasions to the X rays derived from an apparatus for ordinary radiography.

Sir Henry Newland said that the patient had reported at regular intervals ever since. He had no disability of the knee joint and carried on his usual work. The radiographs which had been taken from time to time showed thickening of the bony shell and increasing sclerosis. An area of rarefaction of small size still remained. It might be due to a recurrence of the growth or to a serous cyst. For four years it had remained the same size and is apparently quiescent.

Compound Fracture of the Frontal Bone.

Sir Henry Newland's second patient was a man, aged twenty-one years, who was admitted to the Adelaide Hospital in 1927 suffering from a severe compound comminuted fracture of the frontal bone which involved the right supraorbital arch. The scalp edges were excised. Several fragments of bone, including over 18 millimetres (three-quarters of an inch) of the right supraorbital arch, were removed before the wound was closed. Uneventful recovery followed and the patient was not seen again until January 15, 1931, when he asked whether any operation could be done to remedy the unsightly depression in his forehead and right brow.

On February 13, 1931, the following operation was performed. A flap with a wide base was turned downwards and the extent of the gap in the bone was exposed. The pericranium and the *dura mater* were separated from the edges of the hiatus in the cranial vault and the soft parts from the gap in the right supraorbital arch. The exposed edges of the bone were freshened with a nibbling forceps. A flap was then turned upwards and the anterior half of the right iliac crest was exposed. The muscles were stripped from the crest and from the inner and outer surfaces of the ilium. A section of the crest 18 millimetres (three-quarters of an inch) long was cut from the ilium, the lines of section diverging inferiorly to enclose an oval area approximately equal to the gap in the cranial vault. The graft was removed and its thickness reduced to appropriate dimensions until an accurate fit was obtained. The scalp flap was sutured in two layers, the pelvic wound closed and drainage provided. Sir Henry Newland pointed out that the normal bony contour had been restored.

Fracture of the Tibia.

Sir Henry Newland also showed a patient, aged twenty-two years, who, while riding a motor bicycle on April 8, 1930, collided with a motor car. There was a large lacerated wound below the right knee. A large triangular fragment of bone from the shaft of the tibia lay on the torn clothing. The lacerated skin and torn muscle were excised and some small loose fragments of bone were removed. The fibula was not fractured. The wound was closed, except an extent of about 2.5 centimetres (one inch) where the sutures were loosely inserted to permit drainage. A Thomas splint was applied. Healing took place without complications, but at the end of seven months there was no bony union. This was evidently due to the large V-shaped gap in the tibia, the fragments only being in opposition posteriorly.

On December 1, 1930, a flap was turned back, the ends of the fragments freshened and the medullary canal opened. A large graft was cut from the ilium and trimmed with a chisel until it exactly fitted the deficiency in the tibia. The limb was placed in plaster of Paris. Eleven weeks later sound union of the fracture had taken place.

Cyst of Frontal Lobe following Fracture.

Sir Henry Newland's third patient was a man, aged twenty-eight years, who was kicked on the head by a horse nine years previously. The skull was fractured and brain matter protruded through the wound in the forehead. Some pieces of bone, the patient stated, were removed at operation. The patient was well until three years ago, when he had a fit followed by another a year later. His fits at that time occurred about every month. The fits always occurred at night. They had no localizing features. For three years he suffered from severe headaches. He had been blind in the right eye ever since the accident.

On examination a scar five centimetres (two inches) long and a depression in the skull to the right of the mid-line of the forehead marked the site of the old injury. Complete optic atrophy was present on the right side. No other neurological signs were present.

Dr. L. C. E. Lindon injected air after lumbar puncture and a cephalogram was taken. It revealed some contraction of the right lateral ventricle and slight displacement to the right. The sulci in the region of the anterior pole gave an irregular and indistinct pattern owing to some pathological interference with the ingress or diffusion of the air.

As a definite pathological cause for the fits existed, it was decided to explore the anterior part of the right frontal lobe. This was carried out after an osteoplastic flap was raised. The region of the anterior pole was closely adherent to the *dura mater*. These adhesions were noticed to contain some large veins. As the pole felt cystic, it was incised and a cyst about 18 millimetres (three-quarters of an inch) with soft walls was opened. An incision was made through healthy brain matter and the affected anterior pole was removed. Sir Henry Newland said that only two months had elapsed since the operation. So far the patient had had no recurrence of the headache or fits.

Erythromelalgia.

Sir Henry Newland showed a man, aged thirty-five years, a returned soldier, who had had trouble with his feet for eighteen months. He had no trouble during the war. He had much pain, especially after standing for any time and when he became warm in bed. Red blotches appeared on the top of each foot and toes and tender lumps on the soles. On examination brilliant red areas were present and involved chiefly the great toes. Small dusky purple areas were also to be seen. Small, very tender nodules of infiltration could be felt on the soles. The condition appeared to be a well marked example of erythromelalgia (red neuralgia). Sir Henry Newland said that all treatment had so far been unavailing. He proposed to try decortication of one femoral artery.

Radiograph Exhibits.

Sir Henry Newland showed a series of radiograph exhibits.

The first skiagrams were those of a porter who fractured his left thigh on February 22, 1930, when coupling some railway trucks. A week later a plating operation was performed in a country hospital. Suppuration occurred. He was admitted to the Adelaide Hospital about eleven weeks after the accident. There was then an ununited fracture of the shaft of the left femur and a sinus leading down to a steel plate which had retained its attachment to the upper fragment only. On May 14, 1930, the plate was removed and the leg put up on a Thomas splint. Union was very delayed, but on November 4, 1930, bony union was noted as being present and he was told he might leave off the calliper at night. On February 17, 1931, when riding in the front seat of a motor car, a collision occurred with another car. He was wearing the walking calliper at the time. The inner rod was bent. The old fracture of the shaft remained intact, but the neck of the femur was fractured with firm impaction. Manipulative attempts to undo the impaction had so far been fruitless.

The second lot of skiagrams were those of a butcher who was referred on December 1, 1930, by Dr. Rex Plummer. He gave the following history in the Adelaide Hospital. For the past two years he had suffered from pain in the lower part of the back on the right side. The pain passed down the lateral side of the right thigh to the knee. The pain had increased of late. It was continuous, and became very severe on walking only a short distance.

On examination there was slight scoliosis of the spine, the lumbar curve being to the right and the dorsal to the left. There was tenderness over the right transverse processes of the fourth and fifth lumbar vertebrae. Pressure at these points caused pain down the right thigh to the knee. There was no paralysis or alteration of sensation and the leg reflexes were normal. Radiographs taken by Dr. Stanley Verco showed enlargement, mottling and absorption of the right transverse processes of the fourth and fifth lumbar vertebrae. The laminae on the right side showed similar mottling. Dr. Stanley Verco thought the signs consistent with the presence of hydatid disease.

The intradermal test for hydatid disease gave a doubtfully positive result. The complement fixation test gave a doubtful weak positive reaction. Operation revealed hydatid disease in the right laminae and transverse processes of the fourth and fifth lumbar vertebrae. The cysts extended forwards between the transverse processes. Operative removal of the affected bone was incomplete; 1% formalin was applied to the wound, which was then sutured.

On January 14, 1931, he was discharged with a small sinus discharging a little serum. Just over a week later he was readmitted with a high temperature and a discharge of pus, small cysts and membrane. The wound was reopened and a drainage tube inserted.

Another series of skiagrams were those of a man, aged forty years, who complained of pain and swelling of the upper part of the left leg below the knee. He stated that seventeen years previously he had had swelling in the same region opened and drained. Seven years later the trouble recurred. Sequestrectomy was performed and the cavity was cleansed with eusol according to Carrel's method. A muscle graft with a pedicle was cut from the inner head of the gastrocnemius and implanted in the carinate cavity. Seven weeks before the meeting the pain and swelling returned and a sinus formed in front of the upper end of the shaft of the fibula. This led to an abscess cavity about 18 millimetres (three-quarters of an inch) in diameter in the head of the tibia, which was opened and subjected to eusol irrigation. Its situation and shape contraindicated a repetition of the muscle-grafting operation.

The last lot of skiagrams shown by Sir Henry Newland were those of a man, fifty years old, who stated that, following a knock which caused the right leg below the knee to be painful, the bone had been drilled twenty-six years previously. Until ten weeks before the meeting no further trouble developed and then another knock in the same place was followed by some swelling and much pain. A week previous to the meeting a discharge of pus appeared.

On examination a sinus was obvious 7.5 centimetres (three inches) below the knee on the inner side; 12.5 to 15.0 centimetres (five to six inches) below the knee a red fluctuant swelling was present. The tibia was thickened and tender over its upper third. The radiograph showed a large rarefied area at the junction of the shaft and the upper extremity of the tibia. Operation proved this to be a large abscess cavity with a thick sclerosed wall. Sir Henry Newland pointed out that the long interval between the manifestations of the disease was of interest.

Spondylolisthesis.

Dr. L. O. Betts showed the film of a school boy, aged fourteen years, with spondylolisthesis. He had complained of pain in the lumbar region and stiffness off and on for six months. For the past two months he walked peculiarly. A big boy had jumped on to his back at football about seven months before and caused pain for a few hours, but this did not prevent him from going to school next day. He had the typical prominent sacrum, with lordosis, and short trunk with the costal margin inside the crest of the ileum. The spinous process of the fourth lumbar was 1.25 centimetres (half an inch) forward of that of the fifth and was tender. Pressure over the fourth gave pain radiating down the back of both thighs. Flexion in extension of the left leg caused pain over the outer side of the thigh and leg and in the lumbar region.

X ray examination showed that the body of the fifth lumbar had slipped 18 millimetres (three-quarters of an inch) forward on the sacrum and there was a gap in the neural arch between the articular processes; no destructive lesion was present. A fusion operation was performed from the third lumbar to the sacrum. Dr. Betts said that the neural arches of the fifth lumbar and upper two sacral were incomplete, and the arch of the fifth lumbar quite loose, mobile and ill developed.

Cyst of the Humerus.

Dr. Betts also showed a child of nine years who had suffered from a simple cyst of the humerus. He first reported three weeks after a pathological fracture. Six months later, as the fracture had not completely obliterated the cyst, it was curetted and a bone graft inserted into the cavity.

Cyst of the Head of the Femur.

The third case was that of a young woman, aged nineteen years. Two years previously she had pain in the upper anterior part of the thigh on jumping on the leg at tennis.

This recurred on any sudden jar, gradually increased in frequency and was more easily produced and of longer duration. For the last three months she had had almost a persistent limp, with mild aching at night over the last three weeks. On examination the hip movements were normal in abduction and external rotation, with limited painful internal rotation and flexion to 110°. No flexion deformity was present and no thigh wasting; the length of the limb was normal.

X ray examination revealed a loculated cyst the size of a walnut in the head of the femur extending right up to the joint surface, at the main weight-bearing point, with a very thin shell between the cyst and the joint. The cyst extended just into the neck and was well defined, with a slight increase of density of bone surrounding it. There was slight lipping of the head of the femur and acetabulum, but no alteration of joint space or of contour of head. The cyst was considered to be of the fibrocystic type, although situated in the epiphysis. At operation the neck of the femur was drilled from below the trochanter and the cyst entered. No fluid could be seen to escape. The cyst wall was burred as much as possible and bone dust and fragments pushed into the cyst. The pathological report on a small piece of cyst wall showed a fibrous tissue lining. The patient was put in a weight-relieving calliper. Sufficient time had not elapsed to estimate the result.

Skiagrams.

Dr. C. T. CH. DE CRESPIGNY showed radiographs of a case of multiple subperiosteal spontaneous fractures involving the majority of the long bones of the body.

Dr. GILBERT BROWN showed radiographs of a case of multiple enchondromata.

Dr. OWEN MOULDEN showed radiographs of a spontaneous fracture of the neck of the femur from a metastatic deposit of carcinoma mammae.

Public Health.

MEDICAL SERVICES TO NATIVES IN CENTRAL AUSTRALIA.

At the last meeting of the Federal Committee of the British Medical Association in Australia, held on March 27, 1931, a report on the medical services to natives in Central Australia was submitted by a subcommittee consisting of Dr. J. Newman Morris, Dr. F. L. Davies and Dr. G. Simpson. The report is as follows.

The Council of the Victorian Branch of the British Medical Association on June 27, 1929, requested the Federal Committee to consider the matter of the medical services to natives in Central Australia and submitted the following report:

There are contagious diseases, including venereal disease, prevalent amongst natives, and no medical attention is available. There is no medical and nursing service for aborigines nor for half-castes.

It is true that there are trained nurses at Oodnadatta, Alice Springs, Marranboy, Victoria River Downs, Hall's Creek, Innamincka, Birdsville, employed by the Australian Inland Mission, but their services are intended for the white population. There are no medical practitioners in any of these stations.

It is considered that an efficient medical and nursing service should be available for aborigines and half-castes. Realizing that efficient native orderlies who have been trained in Mandated Territories have proved so useful, it is suggested that an attempt be made to train natives or half-castes in a similar fashion; by this means the inevitable difficulty of the treatment of natives by Europeans may possibly be bridged over.

Such trained natives, as in the Mandated Territories, should be under the control of qualified medical men. It is essential that one or more medical men should be permanently stationed in Central Australia.

The Council of the Victorian Branch be requested to forward this report to the Federal Committee and ask it to treat it as a matter of urgency.

It is suggested that if the Australian Inland Mission is approached, it will be ready to cooperate in any effort made in this direction.

At the ensuing meeting of the Federal Committee, held on September 2, 1929, in Sydney, it was resolved to forward a copy of the report to the Department of Home Affairs. At the meeting of the Federal Committee held in Melbourne on March 28, 1930, it was resolved:

That the Federal Committee views with grave concern the reports as to the need for medical attention amongst the aboriginal populations of Australia and its mandated territories, and that the Branch Councils be requested to appoint from amongst the Branch members committees of inquiry.

Branch subcommittees forwarded reports which were considered by the subcommittee of the Federal Committee. The reports covered the medical treatment of native populations in the various States and were very valuable as indicating the measures taken locally. Very complete care seems to have been given, as far as possible, in Western Australia. Suggestions were made to effect improvement in the care of natives in Northern and Central Australia.

The original report from the Victorian Branch Council stated that contagious diseases were prevalent amongst natives in Central Australia, and that no medical attention was available.

Since the report was forwarded a medical man has been stationed at Alice Springs, and he has been made Protector of Aborigines.

No information was submitted in support of the statement that "contagious diseases were prevalent."

The following information and recommendations, submitted by the Branch subcommittees of inquiry, have been assembled:

Measures Taken by the Federal Government.

The measures taken by the Government for the medical treatment of aborigines in North and Central Australia were found to be:

Four full-time Government Medical Officers are engaged in the work of attending to the treatment and prevention of diseases amongst aborigines and half-castes. Although these officers also render medical attention to the European population, the greater part of their time is occupied in attending to the medical requirements of the aborigines.

An aboriginal hospital and clinic have been established in Darwin. First aid and treatment stations have been established at all police stations, which are provided with full stocks of drugs, dressings and instruments for the treatment of common ailments. Issues of medical supplies to all employers of aboriginal labour and to missions have been made at cost price.

In malarial endemic areas steps are taken, by fixing sites of camps and regulating migration, to prevent the spread of disease. Regular periodical inspection is made of places of employment and camps, and all protectors and superintendents of aboriginal institutions must notify the Chief Protector of all known cases of contagious diseases in aborigines and half-castes in their districts. Every employer of aborigines or half-castes must report to the protector of the district in which he resides, or to the Chief Protector, all cases of contagious diseases in his aboriginal or half-caste employees.

Protectors must furnish to the Chief Protector quarterly and annual reports showing: (a) the names of sick aborigines in the district and the nature of their illness, (b) the names of aborigines sent to the nearest place for professional attendance.

Every employer must report the death of any aborigine or half-caste employed by him.

Consideration is now being given to a proposal submitted by the Chief Protector of North Australia that

employers should be compelled to: (a) notify sickness, (b) transport sick to hospitals, (c) provide medical attention, (d) stock first aid requisites.

These measures, if fully carried out, would seem to be fairly adequate.

Recommendations for Increased Efficiency of Medical Care.

Various suggestions for the increased efficiency of medical care and for hospital accommodation were made in the reports submitted as follows:

The subcommittee of the Victorian Branch considered that some organization should be available for the investigation of epidemics, such as the recent epidemic of scurvy at Hermansberg and pertussis at Alice Springs.

Dr. H. Basedow, of South Australia, offered the following suggestions:

1. Medical officer for Central Australia. I fancy this appointment has already been made.

2. Trained nurse at half-caste home. It would be a good idea to combine the supervision with a regular course (not necessarily too elementary) in nursing, hygiene *et cetera* under the direction of the medical officer. The Germans adopted this system with great success in their African settlements, and it has also been employed in the United States of America, Canada and New Zealand. Thus trained, the qualified wardens would be of great value to the aboriginal community by indicating the principles of public health, improving the sanitary conditions of the camps and eradicating disease.

3. Hospital facilities. A decent home is needed for the half-castes in the Alice Springs district, and I do not see why this could not supply the hospital facilities for the treatment of sick aborigines. Each aboriginal settlement in Queensland has a rather up-to-date hospital in which natives work as assistants under the European matron. I would strongly recommend to make use of the old telegraph station north of the township for this purpose; with little alteration this could be made most suitable. There will be need for such an institution for years to come, hence the need for a decent establishment. The block should be enclosed and a portion of it used for a lock-hospital.

4. Aboriginal reserve. This should be absolute. At the present time there are no fewer than three different parties invading the sanctuary under the pretext of prospecting. I think it would be advisable to appoint a European Superintendent and practical stockman (both married men) to run a cattle station, with the aborigines, for the benefit of the tribe.

In discussing the proposed hospital in Cape York Peninsula the Queensland Committee made the following recommendations:

(a) The preliminary necessity in regard to a hospital on the west side of Cape York Peninsula is adequate organization to insure its success.

(b) This proposal would involve at the outset a preliminary financial commitment of, say, £2,000 per year, recurring, of which there seems no likelihood at the present juncture.

(c) It has been considered for many years and it is thought that a likelier suggestion would be that of a travelling medical missionary working the coasts between Burketown and Thursday Island at regular intervals on a regulated programme and policy.

With regard to minor matters, this committee reported that:

1. The leper station in North Australia has been reorganized and the position of caretaker (man and wife) has been advertised and is under discussion for finalization at present.

2. The question of the Port Darwin Compound has been dealt with in the pronouncement of the Government that no further funds will be available. It is understood that a medical officer has now been stationed at Stuart (Alice Springs) and that he is also local Protector of Aborigines, but that no travelling medical officer has yet been appointed. It is suggested that the Australian Inland Mission might extend its activities to this latter aspect,

and such would be approved and recommended by this committee.

3. The subcommittee doubts whether the suggested aboriginal hospital at Forrest River would be effective in solving the problem of the native girls at Wyndham, Western Australia, and it is strongly of the opinion that for administrative reasons any hospitals which might be built should be placed in town centres. The subcommittee is, moreover, of the opinion that patients are more likely to abscond if the hospital is out of town.

4. Finally, all schemes that are proposed should be so arranged as to permit of coordination, if necessary or desirable, through the Commonwealth Department of Health.

Medical Men as Protectors of Aborigines.

With regard to the question as to whether it were not desirable to appoint medical men as protectors of aborigines, the Victorian subcommittee expressed the opinion that this course should be adopted while the appointment of police officers, as is often done at present, should be avoided if possible. On the other hand, the Queensland committee, in considering the question of the police as "protectors and prosecutors," was of the opinion that, though where a medical officer appointment exists it is strongly to be recommended that he should be the protector of aborigines, its experience was to the effect that resident magistrates of New Guinea who are police officers, combine the two appointments very ably, and if the police are recruited from the same type of men, saw no reason why this experience should not be repeated in Central Australia.

Training of Native Orderlies.

A suggestion was also made in the report of the Victorian Branch Council that something might be done at the established aboriginal clinics to train native dressers, as is done in the Mandated Territory.

The Queensland Committee arrived at the following conclusions:

The situations in New Guinea and Australia are not comparable. In New Guinea hospitals are established in administrative localities which are native centres with a dense population. In Australia there are no hospitals, there is no dense settled population and the natives are of a lower and nomadic type.

The native medical orderly system in New Guinea began with the utilization of a few experienced hospital orderlies who, on returning to their villages at the expiration of their contract of service were given bandages and minor dressings with which to treat minor ailments, and were resupplied from time to time. They also acted as an intelligence force, advising the Government of any frequency of disease demanding attention.

Later, with the success of this scheme, every settled village was instructed as called upon to send in a "boy" for training. These natives in batches were given a course of from three to twelve months' training (generally the former) in the use of nine stock medicines or applications, and the treatment of ulcers and other common native disorders—malaria, conjunctivitis, dysentery, pneumonia, frambesia, and so on. It was not regarded as safe to permit them to treat venereal diseases, but the medical orderly was under orders to report to the chief of the village and the visiting medical officer any case of which he was aware.

It was found that the system was very unsatisfactory, unless with definite safeguards. The difficulties were: (i) The poor memory of the native, (ii) his lack of initiative, (iii) his waste of material for corroborrees *et cetera*, (iv) his abuse of privileges, for example, demanding payment for treatment illicitly, (v) the non-acceptance by the tribe of his services on the instigation of the old people, especially the old women, (vi) the general apathy of the population.

These difficulties could only be met by an annual course of recapitulation for a month, and by stringent supervision by visiting medical officers. This supervision has in part been extended recently by more frequent

visits by senior native orderlies who are still attached to the hospitals. (There were about 12 of these out of 2,098 medical orderlies in villages in a total population of 200,000 under control. They are most carefully selected "boys.")

It must be emphasized that the only factor rendering success possible is constant supervision. In this connexion it is to be noted that in Central and Northern Australia there is an estimated population of 21,000, of whom 15,000 are nomadic, in a total area of 525,000 square miles. The situation for the provision of such a service, therefore, does not exist.

It was recommended that:

(a) The only possible way to set about the institution of the scheme recommended is by the preliminary establishment of one or more native hospitals in selected localities, for example: (i) At Alice Springs (located in Temple Bar) under the direction of the local medical officer recently appointed, and facilitated by the fact that he is also protector of aborigines. (ii) As a second choice, say, Roper River, for the new aboriginal reserve of Arnhem Land. (iii) As third choice, Borroloola, this latter under the Inland Mission.

(b) The medical officer in charge of such a hospital, once it was operating, would be in a position to train not more than nine boys in a period of three years, of whom it is suggested that after the first year of training three in rotation at three-monthly intervals be always on ambulatory work amongst natives as the practical portion of their course, those on patrol returning in rotation to the hospital and being replaced by the next on the list from time to time.

Recommendations of the Subcommittee.

The subcommittee begs to recommend:

1. That the medical needs of the natives of Central Australia will be efficiently met by the permanent appointment of the medical officer at Alice Springs, provided: (a) That he travels and visits each settlement at least once a year. For this purpose he would need to be provided with means for transport and with a suitable travelling companion who should be a mechanic. Travelling alone would be too risky. (b) That he should be available for the control of epidemics as they arise. (c) That a central, up-to-date hospital for aborigines and half-castes be established at Alice Springs with at least one trained nurse in charge.

2. The duties of such medical officer should include supervision of all lay efforts at dealing with sickness amongst natives. Isolated attempts of this nature are being made.

3. The training of aborigines or half-castes as orderlies does not seem to promise much success, but an attempt could be made as an experiment at a hospital in Alice Springs. Supervision of the work of these orderlies is regarded as essential, but efficient supervision would appear to be difficult in view of the nomadic black population sparsely scattered over a vast area.

4. Wherever a medical officer is appointed, he should be made protector of aborigines.

Observations.

1. It is recognized that at the present time and for some time to come little or no funds will be available to the Federal Government to extend the provision of efficient medical care to natives in Central Australia.

2. It would appear that in North Australia there is at the present time ample provision for the medical care of the aboriginal population.

3. The subcommittee is of the opinion that the medical needs of the natives of Australia are not yet sufficiently estimated and that in order that the position may be more adequately met, the Federal Government should instruct a medical practitioner conversant with the aborigines to make a thorough inquiry into the position and make recommendations. The recommendations should be, as far as possible, adopted and carried out.

Appendix.

The Care of Aborigines in Western Australia.

The estimated native and half-caste population of Western Australia is 25,648. Some 10,000 are estimated to be outside the influence of civilization. Some 15,648 of these natives are under the general supervision of the officers of the Aborigines Department or are assisted by mission societies operating in the State. It must be admitted that the enormous area over which the natives of Western Australia are distributed, renders supervision of them very difficult, but in spite of this it is considered that there are a very few who do not receive assistance when required. In Western Australia, wherever a medical man or hospital is available, medical treatment can be obtained for the natives. Elsewhere a great deal of first aid and whatever medical help can be given by managers of stations are given, and wherever it is quite evident that the services of a medical practitioner are necessary, every effort is made to take a native to the nearest doctor, this sometimes necessitating transport of a hundred or more miles. As regards treatment for venereal disease in areas remote from medical aid and where there are difficulties in the way of obtaining it, treatment on the lines laid down by the Commissioner of Public Health is carried out by managers of stations, if these are considered competent to do so. Medical officers are stationed at Geraldton, Carnarvon, Roebourne, Broome, Port Hedland, Onslow, Derby and Wyndham on the west and north coasts, and a hospital is established at each of these ports. At Port Hedland and Derby there are special native hospitals in addition, where natives are catered for apart from the existing white population.

Obituary.

STANLEY JAMES DOCKER READ.

DR. STANLEY JAMES DOCKER READ, who died suddenly from heart seizure at Hall's Gap in the Grampians, Victoria, on April 23, 1931, was born at Springhurst, Victoria, in 1869. He was the second son of the late James Read and grandson of one of the earliest pioneers of the North-East, the Reverend Joseph Docker, of "Bontharambo," near Wangaratta. He first of all received private tuition and then went to Hawthorn Grammar School, where he was taught by the late Professor Irving. He went to the Melbourne Grammar School in 1886 and after passing his matriculation in 1887, became a medical student at Ormond College. He qualified as Bachelor of Medicine in 1893 and as Bachelor of Surgery in the following year. After serving as resident medical officer at Saint Vincent's Hospital, Melbourne, he went for a space to Rockhampton Hospital, Queensland. He left Rockhampton in 1900, went to England and studied for a while at Guy's Hospital. At the end of 1901 he took up practice at Eaglehawk. He married Miss Florence Haylock, daughter of the late Alfred Haylock, of Rockhampton. He transferred his practice to Horsham in 1903 and resided there for twenty-three years. In 1927 he retired and purchased Clifton Estate near Harrow, where he lived until the time of his death. He is survived by one son and two daughters. His wife predeceased him a few years ago.

Dr. F. A. Newman writes:

The lamented death of Docker Read, removes from our midst a man of very sterling worth, one of Nature's gentlemen. He graduated at Melbourne University in the early 'nineties of last century. He was successively resident medical officer to Saint Vincent's, Children's and Women's Hospital, Melbourne. By his diligence he made most of his opportunities to gain a sound knowledge of his work. Fortified by a good experience, he was appointed resident medical officer to Rockhampton Hospital, Queensland, where he worked for several years. Returning to Victoria, he started practice at Eaglehawk, and on the death of Dr. Ritchie, succeeded him in Horsham. Ritchie was a very able man, and Read was eminently qualified

to carry on the high standard set by Ritchie. He stayed in Horsham about twenty-five years, during which period he was medical officer to Horsham Hospital and carried on the important and often very trying work of general practitioner in an important provincial centre. He was a good operator, very painstaking and deliberate in his work. Above all he had the spark of human kindness highly developed. He was indeed a beloved practitioner.

DAVID GRANT.

In passing judgement on their fellows men can use only the knowledge they have of their doings, their teachings of their influence on the lives of others. In the world of medicine men are esteemed oft-times by the part they play in corporate gatherings, congresses and the like, by their writings and by the force of their spoken words. To relatively few persons as a rule is it given to know intimately the inner man behind the word and deed, to study the character and to appreciate the qualities of heart and mind leading to great or generous action. David Grant, whose death at the ripe age of seventy-seven years has recently been recorded in these pages, was one who was looked up to as a leader by men of his own generation. He was not so well known by those of the younger generation, because he was compelled by ill health to withdraw from the prominent place that would have been his in the ordinary course of events.

David Grant was born in 1854 in Fifeshire, Scotland. He became *dux* of his school, the High School, Stirling, and passed to Edinburgh University. He devoted his attention first of all to the *litteræ humaniores*, and after taking first class honours in each year graduated as Master of Arts with the Masson Medal in 1872. In 1876 he graduated in medicine and was awarded the Etiles Scholarship as the most distinguished student of his year. He thus had laid a good foundation for his future career and the structure that he built was in keeping with the foundation. It is not necessary to trace step by step the successive activities of this notable man. His friend, Sir Henry Maudsley, has told the story so well in his appreciation appended hereto that the attempt would be both superfluous and infective. At the same time reference may be made to the fact that the Melbourne Hospital lost his services on account of the absurd and undignified way in which appointments at that time were made. Election to positions on the staff was carried out by popular vote of the subscribers. Fortunately, the method has long ago been discarded and no useful purpose would be served by going further into the electioneering methods that were used, methods best described as those of the worst type of parliamentary election with its possibilities of advertisement and scandalous abuse. His upright soul had revolted against some of the conditions obtaining in the hospital and he had not hesitated to speak as he thought before a Royal Commission which was appointed in 1890 to inquire into and report upon the condition and management of the charitable institutions of the Colony. It was not to be wondered at that his candidature was unsuccessful. He was, moreover, a man of vision, and in his evidence before the Royal Commission he said that the Melbourne Hospital should be pulled down and erected on a larger site. Doubtless this evidence had something to do with the recommendation of the Commission in its first progress report, that the hospital should be removed to the site known as the Pig Market. What was the Melbourne Hospital's loss was Saint Vincent's Hospital's gain, for Grant, with the late George Adlington Syme, did a great deal towards the foundation of the clinical school in that institution.

There can be no doubt that the practice of medicine and the members of the medical profession in Australia are much poorer by the fact that Grant was compelled by ill health to withdraw from his activities in the corporate life of the profession. Even so, his character and example were an inspiration to those who came in contact with him, and his judgement was so mature that his advice and help were freely sought. He was not appealed to in vain. The medical profession in Victoria and

throughout Australia will honour his memory. Men of his calibre are few.

Sir Henry Maudsley writes:

My intimate friend, *confrère* and patient of over forty-three years, David Grant, has passed in his seventy-eighth year, but my memory of him will continue to grow and will ever be a source of joy in my own last lap. Born at Stirling, Scotland, in March, 1854, educated at Stirling Academy, where he attracted the attention of his head master by his ability and studious habits, he matriculated at Edinburgh University at the early age of fourteen in 1868 and entered the Faculty of Arts, graduating in classics, philosophy and English literature in 1872 after a distinguished course, attracting the attention and admiration of Professor Blackie in classics and of Professor Masson in English literature. In mathematics he was distinguished by tying for a prize with the best mathematician of his year. From the Arts Faculty he entered the Medical Faculty in 1872 and after an equally distinguished course graduated M.B., Ch.B., in 1876 and was awarded the most coveted Etiles Scholarship as the best medical graduate of his year, that is, throughout the course.

In 1876 and 1877 he filled the resident post at the Royal Infirmary, his fellow residents afterwards becoming distinguished physicians and surgeons. Sir James Mackenzie, the world-wide cardiologist, was one of his clinical clerks. In '77-'78 he was a resident at the Children's Hospital, Edinburgh. In 1878-1879 he was resident physician at the Royal Hospital for Consumption and Diseases of the Chest near Ventnor, in the Isle of Wight. Later he worked at Vienna at internal medicine, pathology and in the special departments of laryngology and ophthalmology. In 1883, after a term of residence at the Barnes Convalescent Hospital at Chester, in Cheshire, an annexe of the Royal Manchester Infirmary, he was appointed resident physician at the Manchester Infirmary, his colleagues on the surgical side being Pollard, an old University College man, afterwards Surgeon to University College Hospital, London, and Professor of Clinical Surgery.

In 1884 or 1883, on account of his health, he came to Australia and joined the Lunacy Department of New South Wales as a medical officer at Callan Park. He was much attracted by the late Dr. Manning, the head of the department, for whom he had the greatest respect and admiration. The regard was mutual. After two years he returned to England, but within a few months he was back in Australia, in Melbourne, about the end of 1886, when he determined to settle as a physician. Within a month he was elected by the University as lecturer on *materia medica* and elementary therapeutics, and by the Melbourne Hospital to an out-patient physiciancy.

It is not to be wondered at that a man of his ability and his wide clinical experience, his knowledge of the world, his experience in various schools of medicine, with the influences upon him of his teachers in Edinburgh, Laycock, Balfour, Fraser (for Edinburgh, with its great physicians and surgeons, Lister, Syme, was a centre of attraction to all the great physicians and surgeons of the world—the surroundings must have been inspiring), with the influence of the Manchester School, Ross as a neurologist, Sir William Roberts as a general physician, Thursfield (from Ross he had the foundations of his sound knowledge of neurology, from Balfour of what was then known of cardiology, and Balfour was inspiring to Mackenzie, from Laycock the way of looking at a patient in his totality and not as a disease), with his clinical experience in diseases of the chest, his practical knowledge of the use of the laryngoscope and of the ophthalmoscope (was ever a physician better equipped for clinical teaching than he?), at once made his mark and within a few months was looked upon as a great teacher by the students and a great physician. He was medical officer to the Emigrants' Home, where he had a wealth of material, which he made use of to the advantage of the patients and of the students and of the Medical Society.

In 1891, unfortunately, owing to the system of election, he was not elected to the in-patient's physiciancy. He had acted as in-patient physician for several months. Later on, three or four years afterwards, he was physician to the

Saint Vincent's Hospital, and with Mr. Syme laid the foundations of the clinical school.

Grant was a man of great moral courage, of high principles, tolerant of men's infirmities, but intolerant of charlatanism, meanness and insincerity. It seemed to me that he carried out his duty to do to all men as he would they should do to him, in his dealings with patients, with *confrères* and the public. A man of great natural ability, a keen, alert mind, receptive and retentive, a wonderful memory, great industry and great courage.

He was a great classical scholar and read Greek and Latin to the end of his days. He had a great knowledge of English literature, of Scottish history and of poetry.

He was a fluent speaker and had a facile pen (at one time he wrote most interesting leading articles on medical subjects for the daily press). He was an excellent lecturer, humorous and witty.

He was a great and wise physician, methodical in ascertaining objective signs and subjective symptoms; logical, but ever aware that the conclusions would be wrong if the premises were wrong and ever wary of the uncertainty of premises. He looked on every patient in his totality and not as a case of a disease. He was never carried away by a new method of diagnosis, a new set of symptoms, or a new method of cure, but reserved his judgement until the new method had been tried. At one time he was considered to be a pessimistic physician, taking a gloomy view, but this was not the case. He was sincere and honest, and always acted for the good of the patient, never taking away hope. In acute cases he inspired the patient with the will to get well, in chronic cases he instilled into them with their treatment a way of adjusting themselves to new conditions of impaired health. His patients had great trust in him and great confidence, and he helped many a one to be a useful citizen in spite of his chronic illness.

Grant was a life worshipping in its diverse aspects amid its wonders. Music he appreciated, and was at one time devoted to it; he had a good voice.

Art in pictures, sculpture too, and literature in all its forms. He was an expert shorthand writer and kept a diary for many years. Scotland he was naturally devoted to. He was a patriot and a great Imperialist. He believed in the English, their wonderful genius for statesmanship, their genius for colonization and for dealing with subject races as no other country did.

He was a brilliant conversationalist, fond of society, a genial host and a sincere friend. For the last forty years he suffered from chronic ill health, scarcely a day passing without great discomfort. In spite of this he did a great deal of work.

Of committees he was intolerant, but his advice was often sought. He was on the Council of the University, but ill health led him to retire.

He was a brilliant physician, a great physician, and a wise physician. He was an honourable and upright gentleman. His somewhat caustic humour never hurt anybody.

I am proud to think that in our forty-three years' intimacy we never had any coolness, although we practised the same branch of the profession. We were not rivals, but cooperators. To the end his intellect was keen, his humour the same, and his sympathy the same. Had he enjoyed robust health, his practice, which was big, would have been greater.

Dr. R. Hamilton Russell writes:

Through the death of Dr. David Grant the medical profession throughout Australia has lost an acknowledged leader. Many, too, will mourn a beloved physician, while others again will sorrow at the loss of a most valued and admired friend. And that is only the beginning of the story. There are those, and they must comprise a large proportion of the Melbourne graduates of later years,

who never even saw Dr. Grant and for whom his personality will seem just a legend of Edinburgh high scholarship that walked with great dignity the stage in Melbourne for a few years and has now vanished again into the mists of the future.

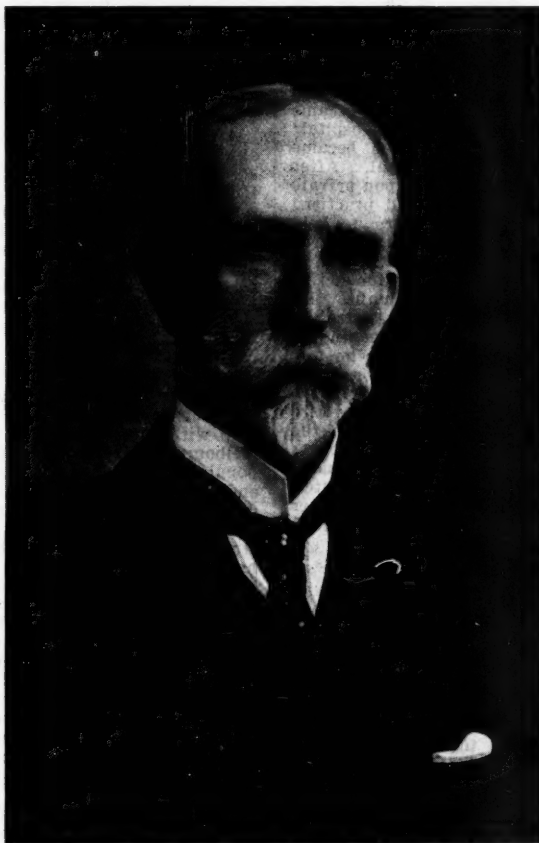
There is no doubt that Dr. Grant was a great man who accomplished much; there is also no doubt that he would have accomplished still more but for the conditions imposed upon him by the hand of Nature. He early had the knowledge thrust upon him that life could be no longer looked forward to as a gay procession such as his brilliant intellectual powers (had they been given free play) would have made it, and he settled down with unflinching courage to a life-long struggle between a spirit that was strong and a flesh that was deplorably weak.

When, about forty years ago, he came to Melbourne to settle, he received a warm and friendly reception from members of the profession, and thence onward to his retirement his opinion as a consultant was often sought by practitioners of every class and degree. Yet, after all, one must admit that Dr. Grant's life was to a large extent that of a recluse; he liked seeing friends *tête-à-tête*, but he seemed to have difficulty in

adjusting himself to a numerous company. In a personal talk, however, he would be supremely charming. Whatever the subject under discussion, it might be trusted to bring forth a profusion of apposite allusions and witty little explosions. He would have been an ideal clinical teacher had not either inclination or chance led him into other paths. He had an uncompromising hatred of "sham"—an aversion that he was fortunately enabled to mollify somewhat, thanks to a keen sense of the ridiculous.

Before closing this brief notice, I have asked another intimate friend of Dr. Grant to add a few words for reasons that will be at once understood. Dr. H. Osburn Cower writes:

Dr. Grant was my friend for over forty years and never failed in counsel, criticism or encouragement. His was the most acute mind devoted to the problems of medicine with which I have come into personal contact. To the end of his life the problems of medi-



cine were his central interest, in spite of the fact that his mind had an unusually wide and varied range. As a physician I place him beside my old teacher, Sir William Gairdner, whom he also greatly revered. To come into contact with Dr. Grant was a stimulus, and to be his friend was a privilege indeed.

CHARLES RICHARD PLAYER.

DR. CHARLES RICHARD PLAYER, whose death, as previously recorded, occurred on March 23, 1931, was the son of the late Henry John Player, of Mansfield, Victoria. He was born at Mansfield and received the first part of his education at the State School in that town. Later he went to the Church of England Grammar School, Melbourne, and from there he passed to the Medical School of the University of Melbourne. He qualified as Bachelor of Medicine and Bachelor of Surgery with first class honours in 1894. Four years later he obtained the higher degree of Doctor of Medicine. After serving as resident medical officer at the Melbourne and Alfred Hospitals for several years he entered the Lunacy Department and became Senior Medical Officer of the Sunbury Mental Hospital; he held this position for five years. He then became Medical Superintendent at the Ballarat Hospital. After this he returned to Sunbury, where he entered upon private practice. Ultimately he settled at Malvern and practised there for about twenty years. For some years he held the position of Physician to In-Patients at the Alfred Hospital.

At the outbreak of war Player volunteered for active service, but was rejected as being medically unfit. He was, however, called upon to serve at Number 5 Australian General Hospital, St. Kilda Road, and on the opening of Number 11 Australian General Hospital, Caulfield, he was transferred to that institution. He attained the rank of major and served till the end of the war. About twelve years ago he was compelled, owing to ill health, to retire from active practice. He then became interested in the question of child delinquency at the Children's Court; for years he held the position of Chairman. He founded and was first President of the Children's Court Magistrates' Association. As Justice of the Peace he was on the roster of the Melbourne City Court, sitting on the bench regularly until compelled by increasing disability to desist. He is survived by a widow and two daughters.

Sir Richard Stawell writes:

With the death of Dr. Charles R. Player there has passed away from Melbourne a very fine type of a medical man who largely gave himself up to unselfish service to the community in which he lived. In his active professional life he was a physician who not only carried on for twenty years a successful general practice in Malvern, but was also an honorary physician at the Alfred Hospital. The work at the hospital was of intense and steady interest to him, and he was well qualified for the position, seeing that, after terms of service as resident medical officer at both the Melbourne Hospital and the Alfred Hospital, he took the senior degree of Doctor of Medicine.

In my own professional life I always found consultations with Dr. Player intensely interesting and most satisfactory. Nothing could have been better than his full and honest presentation of the practical problems for discussion, and nothing could have been more stimulating than his thoughtful criticisms on these occasions. Arising from these consultations I found that there developed in me a sense of friendship and personal regard for Dr. Player which deepened year by year, especially during the time he and I were on the medical staff of the Number 11 Australian General Hospital, Caulfield. In that work his general medical knowledge, his well balanced temperament, his understanding and kindness were of the greatest value and help.

Though never robust, Dr. Player always kept himself "fit" and was keen in his work, and when I had the privilege of meeting him in the happiness of his own home and with his family, I always felt he was a most delightful companion with a pleasant and considerate sense of humour.

About twelve years ago, in consequence of ill health, and particularly because he was subject to disabling attacks of vertigo, Dr. Player retired from active practice, but did not retire from service to the community. He, as a Justice of the Peace, took up work on the Bench of the Children's Court, and here he found a splendid expression of his ability and of the essential unselfishness of his character. In all that he did during a varied career Dr. Charles Player did splendid, honest, helpful work, and in a quiet, unobtrusive way his life was a fine example to us all.

CORNELIUS GEORGE CROWLEY.

DR. CORNELIUS GEORGE CROWLEY, who died at Malvern, Victoria, on May 9, 1931, was born at Bendigo in October, 1872. He was the son of the late John Crowley, one of the earliest pioneers of Bendigo. He was educated at Xavier College, Melbourne, and before taking up the study of medicine in 1892 he took his Bachelor of Arts degree. He graduated as Bachelor of Medicine and Bachelor of Surgery in 1896 and was the winner of the Beane Scholarship in Surgery.

After graduation Crowley became resident medical officer at the Melbourne Hospital and was later house surgeon at both the Alfred Hospital and the Women's Hospital. Before settling down in practice he made an extensive tour in the East and in Europe and carried out investigations in the hospitals of France, Great Britain and Ireland. On his return he took up general practice in one of the suburbs of Melbourne, but after deciding to specialize in dermatology he visited European clinics for purposes of study. On his return he practised in Collins Street as a dermatologist. He built up an extensive practice and was recognized as an authority on skin diseases.

Sir Colin MacKenzie writes:

It was with sincere regret that I learned of the passing away of a very old friend, Dr. Neill Crowley. My friendship with him dated back to medical student days at the Melbourne University and Melbourne Hospital. He was the popular Secretary of the Medical Students' Society, endeared to his fellow students by his happy and generous disposition, and noted for his marked musical talent. Having already taken his Arts degree, he brought to the study of medicine a logical and well trained brain, which held no small store of the philosophies. This wider outlook was of immense value to him as a resident medical officer, first at the Melbourne and later at the Alfred and Women's Hospitals. It helped him to appreciate the sound advice of his distinguished teacher, Sir Thomas Fitzgerald: that every practitioner, after qualifying and before specializing, should spend some time in general practice and, if possible, study abroad, so as to be quite certain of a sound knowledge of the theory and practice of medicine in all its branches. Dr. Crowley went overseas and later was for some years in general suburban practice in Melbourne before turning his attention to the study of the skin and its diseases. For the second time he proceeded to France and Great Britain and attended the clinics in the leading centres. Returning to Melbourne, he built up an extensive dermatological practice.

Dr. Crowley was very interested in the comparative pathology of skin diseases, and was of the opinion that a simple classification of these might be made along biological lines, such as is now being done in connexion with neuro-muscular and other conditions. It was his intention to have limited his practice and devoted much of his time to researches in this direction, but unfortunately his health broke down and his theories were never put into practice.

Correspondence.

ANTERIOR POLIOMYELITIS.

SIR: Re organization. I am convinced that in Melbourne we have an excellent committee to deal with the collection

and distribution of serum. We have made mistakes in policy, but that is being rectified and we hope that sufficient serum will be available for hospitals and surgeons at convenient centres. So far, we have met every demand for serum. It has involved some amount of unpaid work by the staff of the City Council and the members of the Committee, especially the Medical Officer of Health, the Secretary of the Health Committee and the Treasurer's Department. Too much praise cannot be given to Dr. Morgan for his skill and care in providing the serum. The value of municipal control is (i) continuity and (ii) constant financial relief. The help of the Government has been invaluable. The treatment of infectious diseases in Victoria is borne by government and municipalities, £1 for £1. As the country municipalities have shirked their duty, the Government has shouldered their responsibilities. It has been stated by people who should know better, that municipal control is the worst form of organization and pays insufficiently. From May 7 to May 28 we paid £95 for services rendered, not including expenses and consultation fees, at the rate of £1 1s. an hour for obtaining blood and despatching serum. I think the other States would be well advised to follow our Victorian plan. Our activities have been misunderstood by the profession, but I hope that in the future, by collaborating with the Council of the British Medical Association, that the abuses which have crept in will be completely rectified. Our Committee, which is composed entirely of medical men, has every desire to serve the public and the profession.

Yours, etc.,

W. KENT HUGHES.

22, Collins Street,
Melbourne, C.I.
Undated.

Proceedings of the Australian Medical Boards.

TASMANIA.

THE undermentioned has been registered under the provisions of the *Medical Act*, 1918, of Tasmania, as a duly qualified medical practitioner:

Stevens, Percy Alexander, M.B., B.S., 1913 (Univ. Melbourne), Richmond, Queensland.

Public Health.

DANGEROUS DRUG REGULATIONS IN VICTORIA.

THE Victorian *Government Gazette* of April 15, 1931, contains a reference to the Dangerous Drugs Regulations of 1931, which should be noted by Victorian medical practitioners. The reference is as follows:

Under the powers in that behalf conferred by the Poisons Acts, His Excellency the Governor of the State of Victoria, by and with the advice of the Executive Council thereof, doth make the Regulations following, which have been recommended by the Pharmacy Board of Victoria:

1. These Regulations may be cited as "The Dangerous Drugs Regulations 1931," and shall come into force when published in the *Government Gazette*, and shall be read and construed as one with "The Dangerous Drugs Regulations 1930."

2. Regulation 5 (c) of the Dangerous Drugs Regulations 1930 is hereby rescinded, and the following regulation shall be substituted therefor, namely:

(c) Nothing in Part I of the Dangerous Drugs Regulations 1930 shall apply to any of the preparations mentioned in the Second Schedule thereto as substituted by these Regulations, or to any drug or preparation which has been denatured in manner approved by the Board.

3. For the Second Schedule to the Dangerous Drugs Regulations 1930 there shall be substituted the schedule to these Regulations, which schedule may for all purposes be cited as the Second Schedule to the Dangerous Drugs Regulations 1930.

SCHEDULE REFERRED TO.

(Substituted for and may be cited as the Second Schedule to the Dangerous Drugs Regulations 1930.)

SECOND SCHEDULE.

Part I.

(Regulations Nos. 5 (c) and 38 (a).)

Cereoli iodoformi et morphinae B.P.C.
Emp. opii B.P. 1898.
Lin. opii B.P.
Lin. opii ammon. B.P.C.
Pasta arsenicalis B.P.C.
Pil. hydrarg. e. opio B.P.C.
Pil. ipecac. c. scilla B.P.
Pil. plumbi c. opio B.P.
Pil. digitalis et opii co. B.P.C.
Pil. hydrarg. c. cret. et opii B.P.C.
Pulv. cretae aromat. c. opio B.P.
Pulv. ipecac. co. B.P. (Dover's powder).
Pulv. Kino Co. B.P.
Suppos. plumbi co. B.P.C.
Tablettaa Plumbi c. Opio B.P.C.
Ung. gallae c. opio B.P. (gall and opium ointment).
Ung. gallae co. B.P.C.

Part II.

(Regulations Nos. 5 (c) and 38 (c).)

(1) Preparations for the eyes, ears, nose, or throat, containing not more than 1 per centum of cocaine or cocaine hydrochloride, when prescribed by a duly qualified medical practitioner, and when denatured by the addition of aqua formol, or any solution of adrenalin, salts of zinc, copper or mercury, so as to render such preparation unsuitable for continued internal use or for hypodermic use.

(2) Eye drops containing not more than 2 per centum of cocaine for the purpose of first aid in any factory or workshop registered under the *Factories Act* 1928 supplied by a registered pharmaceutical chemist on the written order of the occupier of such factory or workshop.

(3) Ointments containing not more than 4 per centum of cocaine, or cocaine hydrochloride, when prescribed by a duly qualified medical practitioner.

(4) Preparations and admixtures containing not more than 10 per centum of any specified drug or of any salt compound or derivative of any specified drug.

(5) Preparations or admixtures containing less than 0.2 per centum of morphine (calculated as anhydrous), benzoyl-morphine or other ester of morphine or less than 0.1 per centum of cocaine, ecgonine, diacetyl-morphine, dihydro-morphinone, dihydro-codeinone, or dihydro-oxycodone.

(6) Prescriptions which when dispensed result in the finished product containing less than 0.2 per centum of morphine (calculated as anhydrous), benzoyl-morphine or other ester of morphine or less than 0.1 per centum of cocaine, ecgonine, diacetyl-morphine, dihydro-morphinone, dihydro-codeinone, or dihydro-oxycodone.

(7) Medicinal preparations containing any extract or tincture of Indian hemp as one of the ingredients.

The foregoing Regulations were recommended by Resolution of the Board at its meeting held at Melbourne on the eleventh day of March, one thousand nine hundred and thirty-one.

Honours.

DR. GREGORY SPROTT, of Hobart, has been invested with the star of Commander of the Order of the Hospital of Saint John of Jerusalem.

Books Received.

SURGERY: ITS PRINCIPLES AND PRACTICE FOR STUDENTS AND PRACTITIONERS. by A. P. C. Ashhurst, A.B., M.D., F.A.C.S.: Fourth Edition, thoroughly revised; 1931. Philadelphia: Lea and Febiger. Royal 8vo., pp. 1200, with 15 coloured plates and 1063 illustrations. Price: \$10.00 net.

STRUCTURE SYMBOLS OF ORGANIC COMPOUNDS. AN ADJUNCT TO TEXT BOOKS OF ORGANIC CHEMISTRY FOR STUDENTS AND TEACHERS. by I. W. D. Hackh; 1931. Philadelphia: P. Blakiston's Son and Company. Demy 8vo., pp. 147.

PRACTICAL MEDICINE SERIES: Obstetrics and Gynaecology; Series 1930. Chicago: The Year Book Publishers. Crown 8vo., pp. 640. Price: \$2.50 net.

THE MEDICAL ANNUAL: A YEAR BOOK OF TREATMENT AND PRACTITIONER'S INDEX; Forty-ninth Year; 1931. Bristol: John Wright and Sons Limited. Demy 8vo., pp. 600. Price: 20s. net.

Diary for the Month.

- JUNE 23.—New South Wales Branch, B.M.A.: Medical Politics Committee.
 JUNE 24.—South Australian Branch, B.M.A.: Annual Meeting.
 JUNE 24.—Victorian Branch, B.M.A.: Council.
 JUNE 25.—New South Wales Branch, B.M.A.: Branch.
 JUNE 26.—Queensland Branch, B.M.A.: Council.
 JULY 1.—Victorian Branch, B.M.A.: Branch.
 JULY 2.—South Australian Branch, B.M.A.: Council.
 JULY 3.—Queensland Branch, B.M.A.: Branch.
 JULY 7.—New South Wales Branch, B.M.A.: Organization and Science Committee.
 JULY 10.—Queensland Branch, B.M.A.: Council.
 JULY 14.—New South Wales Branch, B.M.A.: Ethics Committee.
 JULY 21.—New South Wales Branch, B.M.A.: Executive and Finance Committee.

Medical Appointments.

Dr. W. R. M. Drew (B.M.A.) has been appointed to a commission in the Royal Army Medical Corps and has sailed for England to take up the duties of the appointment. By this appointment all vacancies for Australian medical graduates for commissions in the Royal Army Medical Corps for 1931 are filled.

Dr. F. W. Cotton (B.M.A.) has been appointed Medical Officer to the Roebourne Road Board, Western Australia.

Dr. O. W. Frewin (B.M.A.) has been appointed Honorary Clinical Assistant to the Vaccine and Asthma Clinic at the Adelaide Hospital, South Australia.

Dr. H. K. Fry (B.M.A.) has been appointed an Official Visitor to the Mental Hospital at Parkside, South Australia.

Dr. R. McM. Glynn (B.M.A.) has been appointed a Member of the Board of Optical Registration under the provisions of the *Opticians Act*, 1920, South Australia.

Dr. G. M. Barron (B.M.A.) has been appointed Government Medical Officer at Manly, New South Wales.

Dr. R. W. Richards (B.M.A.) has been appointed Government Medical Officer at Blackheath, New South Wales.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser," page xvi.

AUSTIN HOSPITAL FOR CHRONIC DISEASES, HEIDELBERG, VICTORIA: Junior Resident Medical Officer.

DEPARTMENT OF INSPECTOR-GENERAL OF HOSPITALS, SOUTH AUSTRALIA: Honorary Dermatologist.

THE WOMEN'S HOSPITAL OF SYDNEY, NEW SOUTH WALES: Resident Medical Officer.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company, Limited. Phoenix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
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